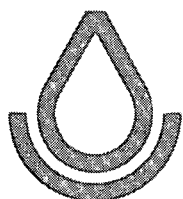
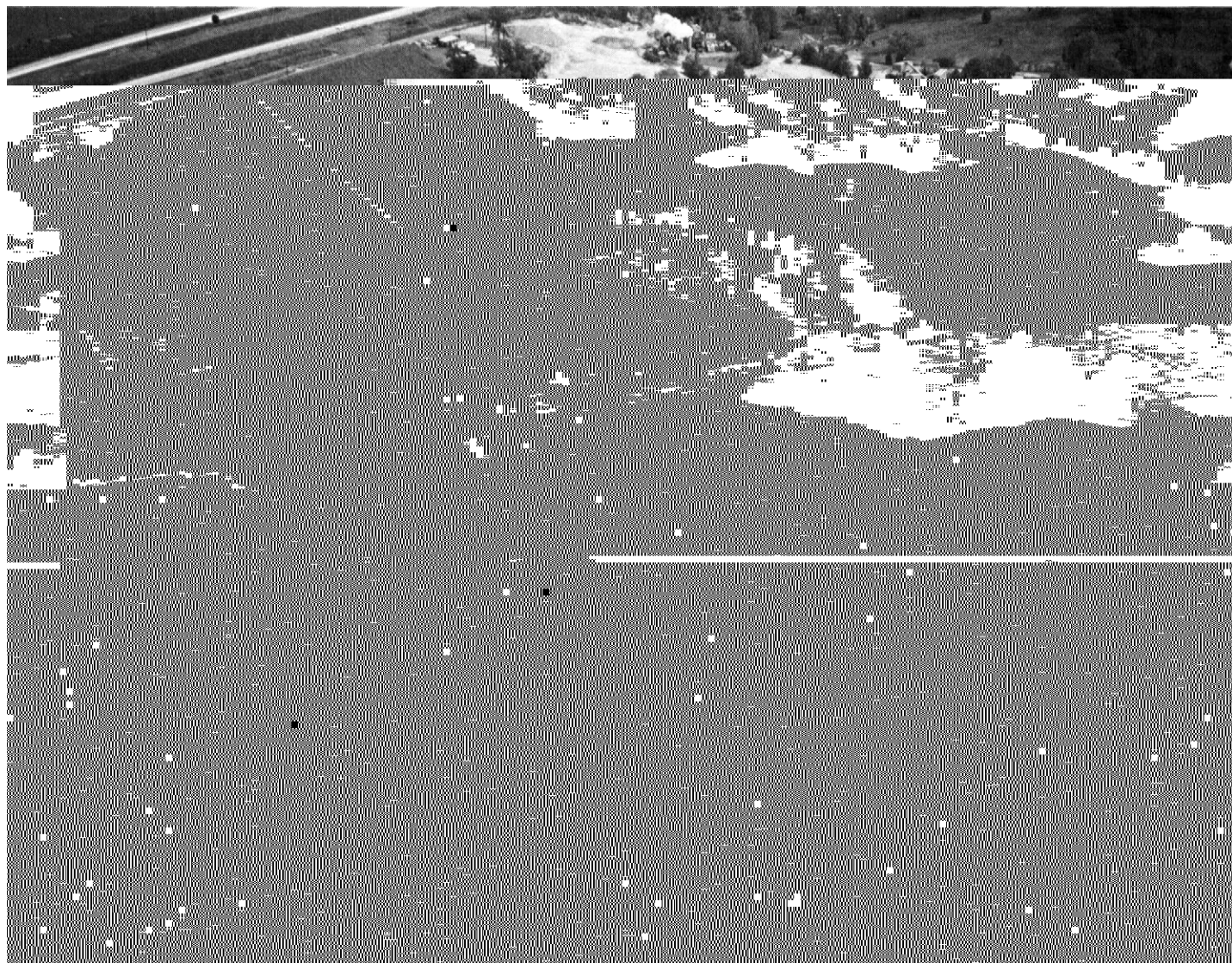


# SOIL SURVEY OF Oldham County, Kentucky



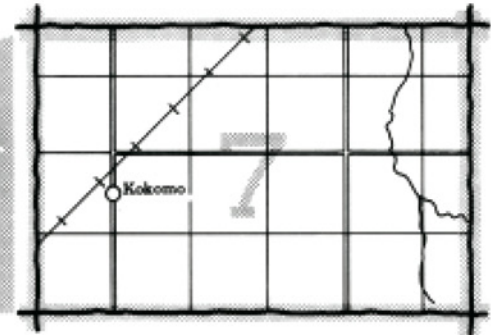
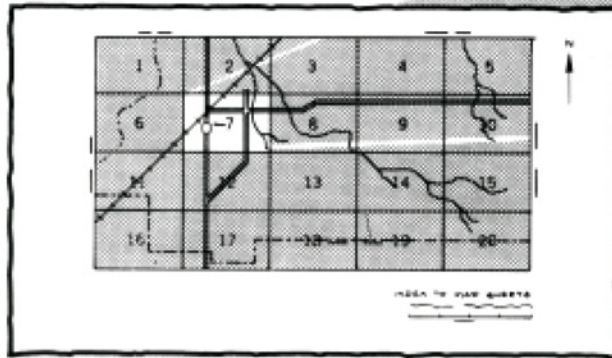
**United States Department of Agriculture  
Soil Conservation Service**

In cooperation with

**Kentucky Agricultural Experiment Station**

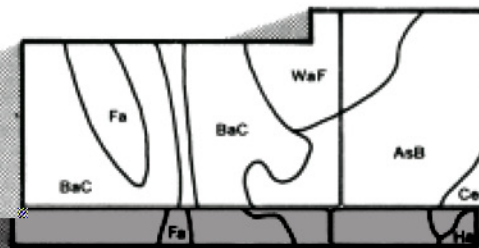
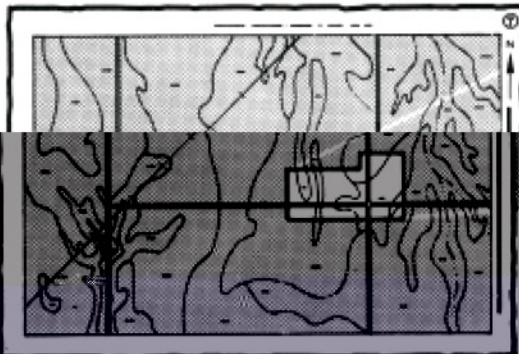
# HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"



2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



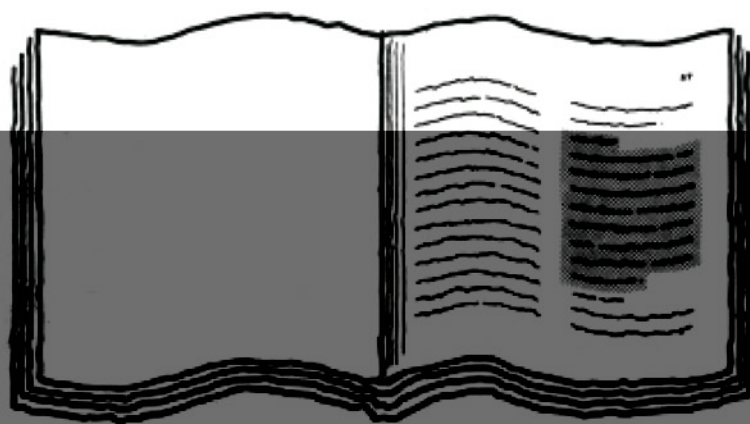
4. List the map unit symbols that are in your area.

**Symbols**

# THIS SOIL SURVEY

5.

Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



Index to Soil Map Units			
Map Unit Name	Page	Map Unit Name	Page
1. 0-1000 ft. deep	100	10. 0-1000 ft. deep	100
2. 1000-2000 ft. deep	100	11. 0-1000 ft. deep	100
3. 2000-3000 ft. deep	100	12. 0-1000 ft. deep	100
4. 3000-4000 ft. deep	100	13. 0-1000 ft. deep	100
5. 4000-5000 ft. deep	100	14. 0-1000 ft. deep	100
6. 5000-6000 ft. deep	100	15. 0-1000 ft. deep	100
7. 6000-7000 ft. deep	100	16. 0-1000 ft. deep	100
8. 7000-8000 ft. deep	100	17. 0-1000 ft. deep	100
9. 8000-9000 ft. deep	100	18. 0-1000 ft. deep	100

6.

See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.

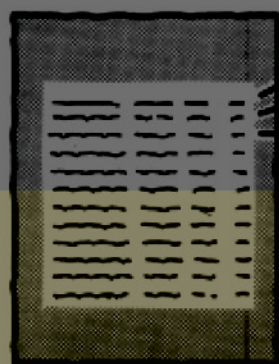
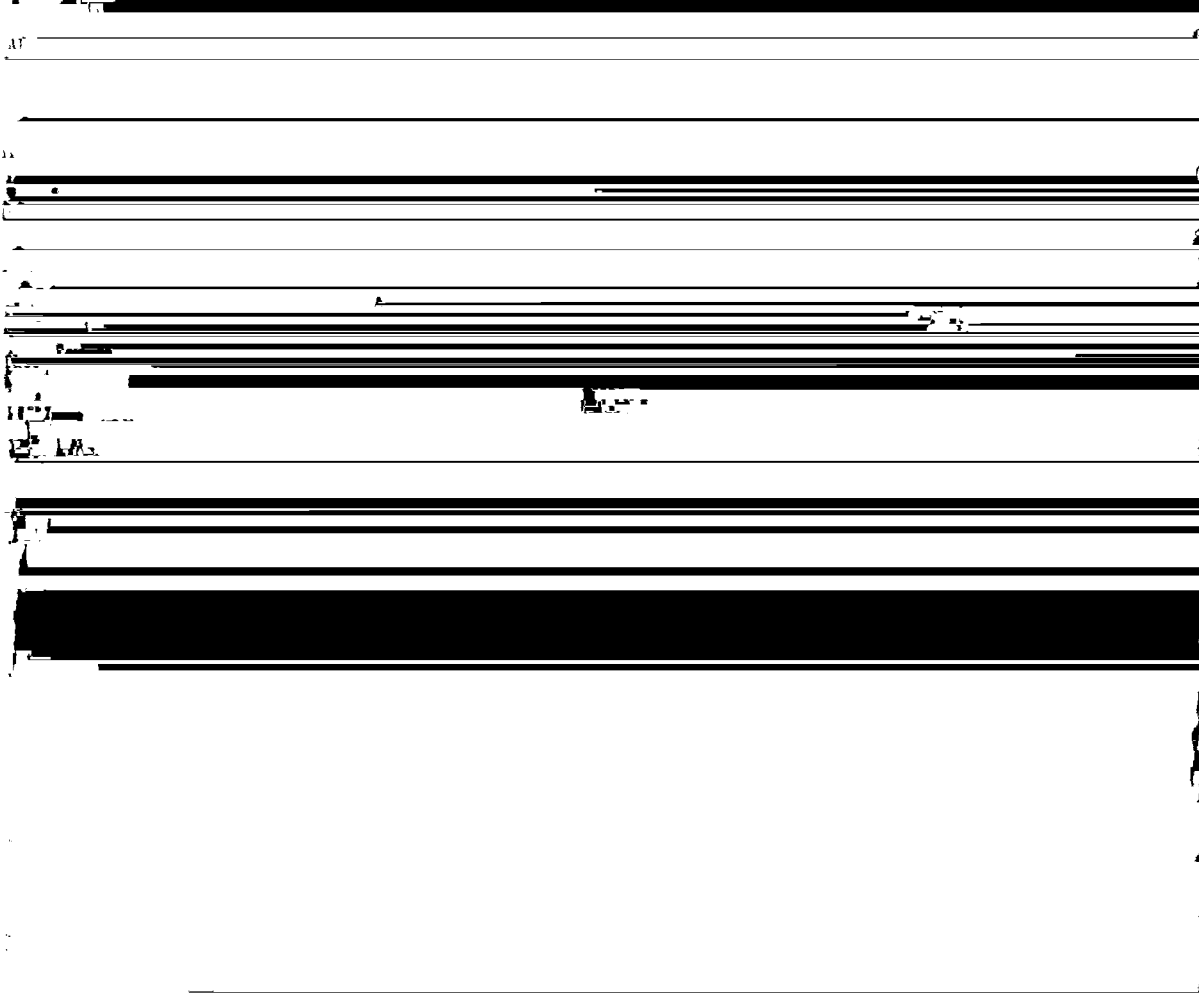


Table 1 - Summary of Tables			
Table	Page	Table	Page
1. 0-1000 ft. deep	100	10. 0-1000 ft. deep	100
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3. 2000-3000 ft. deep	100	12. 0-1000 ft. deep	100
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6. 5000-6000 ft. deep	100	15. 0-1000 ft. deep	100
7. 6000-7000 ft. deep	100	16. 0-1000 ft. deep	100
8. 7000-8000 ft. deep	100	17. 0-1000 ft. deep	100
9. 8000-9000 ft. deep	100	18. 0-1000 ft. deep	100

7.

Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leader-



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## Foreword

I would like to introduce you to the soil survey of Oldham County. This publication can help you and your community plan and use wisely one of our most precious natural resources—the soil.

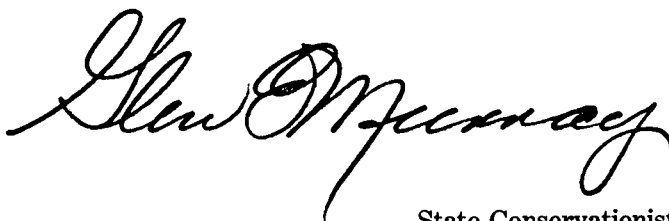
This soil survey was conducted for and is now available to many different users. It can help a homebuyer or developer determine soil-related hazards or limitations that affect homesites. It can help land use planners determine the suitability of areas for housing or onsite sewage disposal systems. In Kentucky, this survey can be very helpful in evaluating and maintaining our important agricultural base. It can assist farmers to estimate the potential crop or forage production of their land. It can be used to determine the suitability and limitations of soils for pipelines, buildings, landfills, recreation areas, and the many other uses where it is important to consider our land resources.

Many people are unaware that great differences in soil properties can occur within relatively small areas. They are also unaware of the significance these differences can make toward success or potential failure of any land related activity. Soils may be seasonally wet or subject to flooding, shallow to bedrock, too unstable to serve as a foundation for buildings or roads, or they may be unsuited to septic tank absorption fields. Also, a high water table may make them poorly suited to basements and other types of underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of broad areas of soils on the general soil map and the location of each kind of soil on the detailed maps are shown in the back of this publication. Descriptions of each kind of soil in the county are provided, and information about specific uses of each of the identified soils is given.

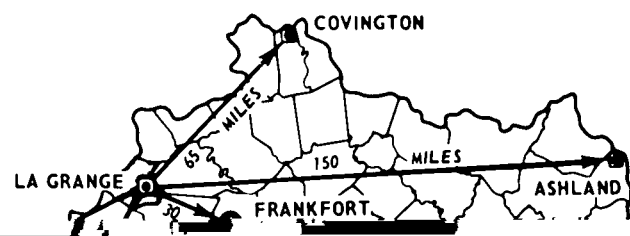
These are only a few of the ways this soil survey can help you. If you need additional information or assistance in using this survey, please call your local office of the Soil Conservation Service or the Cooperative Extension Service. The soil conservationist or soil scientist assigned to the Oldham County Conservation District or the county extension agents and directors can assist you.

I believe this soil survey, along with other natural resource information, will enable you to build a better environment for life and living. The effective use of this publication will assist all of us in the conservation, development, and productive use of our soil, water, and related resources.

A large, stylized handwritten signature in black ink, reading "Glen McCreary". The signature is fluid and cursive, with the first name "Glen" and last name "McCreary" clearly distinguishable.

State Conservationist

\* State Agricultural Experiment Station



# SOIL SURVEY OF OLDHAM COUNTY, KENTUCKY

By Orville J. Whitaker, Soil Conservation Service

Soils surveyed by James F. Fehr, Herman P. McDonald, and Orville J. Whitaker,  
Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in  
cooperation with the Kentucky Agricultural Experiment Station

Oldham County is in the north-central part of Kentucky (See opposite page) and has a population of 16,200. LaGrange, the county seat, has a population of 2,200. The county has a total area of 117,500 acres, or approximately 183.6 square miles.

The county is in the Bluegrass Land Resource Area (4). The Ohio River has cut a deep gorge along the northwestern boundary and serves as a county line with Clark County, Indiana. The northeastern portion of the county is dissected by Eighteen Mile Creek and Pattons Creek and their tributaries. Florida, Early, and Horned-

"Growing degree days" shown in table 1 are equivalent to heat units. Beginning in spring, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 22 inches, or 51 percent, usually falls during the period April through September, which includes the growing season for most crops. Two years in ten, the April-September rainfall is

Creek and their tributaries dissect the central and southern portions of the county from east to west. Eleva-

less than 18 inches. The heaviest 1-day rainfall during the period of record was 6.97 inches at Louisville on March 9, 1904. The long-term average about 45 inches per year.

Ballardsville was at the center of north-south and east-west stagecoach lines.

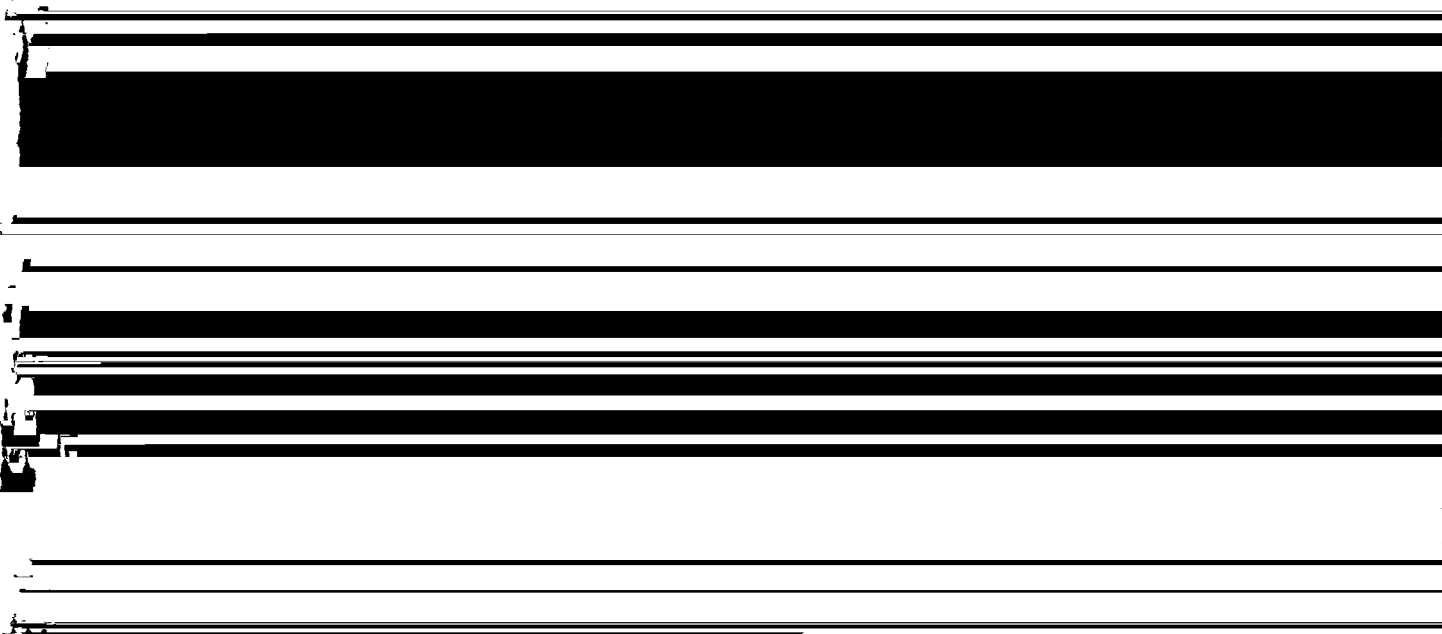
### Natural Resources

Soil is the most important natural resource in the county. Livestock that utilize pasture, hay, and row crops produced on farms are marketable products derived from the soil.

Water is adequate for domestic use throughout the county. Approximately 75 percent of the county is served by a community water system. Water for home use in the remainder of the county is furnished primarily by wells

### Farming

Much of the income in the county is derived from the sale of farm products. However, farming is less important to the economy than it formerly was. A large number of people live on small residential tracts in the county and work in the metropolitan Louisville area. According to the United States Census of Agriculture, of all farm products sold in 1969, 63 percent was from livestock and livestock products and the remaining 37 percent was from crops. Tobacco and corn are the most important cash crops, but soybeans are becoming increasingly important. About 90 percent of the corn crop is kept on the farm and fed to livestock. Alfalfa and clover are the most important



The Ohio River supplies an adequate supply of water for recreation and water transportation. Locks and dams insure sufficient depth to make the river navigable at all times. The River is increasingly used for boating, swimming, fishing, and water skiing. Ponds are used as a source of water for livestock and for fishing and swimming.

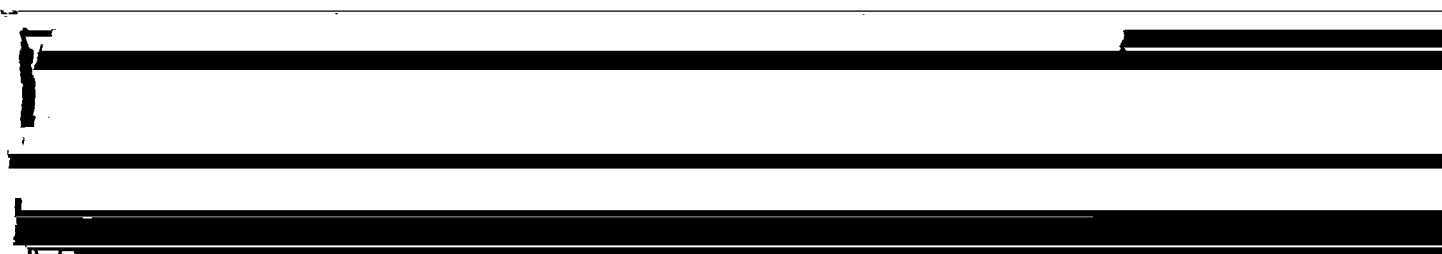
Several limestone quarries in the county supply limestone for farming, industry, and road building.

Sand and gravel are mined from the stream terraces west of Rose Island Road along the Ohio River. These deposits are useful in the construction of roads. Sand and

other grasses are harvested extensively for hay.

Orchard grass was first grown commercially for seed production in the United States in Oldham County by Lilburne Magruder in the 1890's. For many years approximately 80 percent of all orchard grass commercially grown in the United States was grown within 40 miles of Goshen in Oldham County. The highest production years were during and immediately after World War II. Production of the grass declined drastically in the mid 1960's.

In the early days, livestock farming was very diversified and included sheep, hogs, dairy cattle, and beef cat-



soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil mapping units. Some mapping units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Mapping units are discussed in the section "Soil Maps for Detailed Planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and their interpretations are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily useful to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

## Soil Map for General Planning

The general soil map at the back of this publication shows, in color, the soil units for broad land use planning described in this survey. Each soil unit is a unique natural

## Soil Association Descriptions and Potentials

The soil associations of the general soil map are described in the following paragraphs. Potential uses for soils in each association are presented in the descriptions.

### 1. Wheeling-Huntington Association

*Deep, nearly level to strongly sloping, well drained soils that have a loamy subsoil; on stream terraces and flood plains*

Areas of this association are in two discontinuous narrow bands along the Ohio River. One extends from about 1 1/2 miles southwest of the mouth of Pattons Creek to west of the mouth of Morris Branch. The community of Westport is near the center of this area. The other area extends from near the mouth of Bull Creek southwestward to the Jefferson County line opposite Twelve Mile Island. The landscape is made up mostly of moderately broad stream terraces and narrow flood plains.

This soil association (fig. 1) occupies about 3 percent of the county. About 48 percent of the association is Wheeling soils, 18 percent is Huntington soils, and the remaining 34 percent is minor soils.

Nearly level to strongly sloping Wheeling soils are on stream terraces above the Huntington soils, which are on flood plains. Wheeling soils are deep, well drained, and have a brown loamy subsoil. Huntington soils are deep, well drained, and have a dark colored surface layer and a brown loamy subsoil.

The minor soils on the stream terraces in this association are well drained Elk, moderately well drained Otwell, and the somewhat poorly drained Weinbach. The minor soils on flood plains are moderately well drained Lindside and somewhat poorly drained Newark.

This soil association is used mainly for growing row crops (fig. 2), pasture, and hay. A small percent is in sub-

mile south of Westport along the Ohio River bluff to the Jefferson County line. These soils formed in clayey residuum from soft limestone and calcareous siltstone, sandstone, and shale and from hard limestone bedrock.

This soil association makes up about 12 percent of the county. About 45 percent of the association is Beasley soils, 30 percent is Caneyville soils, and the remaining 25 percent is minor soils.

Beasley soils are in two different landscape positions in

hay, and pasture. A significant acreage is in subdivision developments. Several horse farms are in the association. Erosion is the main limitation to the use of these soils for growing row crops.

This association has high potential for farming. It generally has high potential for urban development except for the soils that have a fragipan, which have limited use for septic tank absorption fields. Most of this association has high potential for woodland but some

clayey residuum from interbedded soft limestone and calcareous siltstone, sandstone, and shale and from hard limestone bedrock.

This soil association makes up about 10 percent of the county. About 30 percent is Beasley soils, 20 percent is Cynthiana soils, 15 percent is Faywood soils, and the remaining 35 percent is minor soils.

Gently sloping and sloping Beasley soils are on narrow ridgetops. On the hillsides below are intermingled steep and very steep Cynthiana, Faywood, and Beasley soils

lower part of the subsoil is a yellowish brown, mottled, loamy, slowly permeable fragipan.

Minor soils in the uplands of this association are well drained Brassfield, Caneyville, Crider, and Hagerstown soils and well drained Nolin soils in the flood plains.

This soil association is used mainly for hay and pasture, but a considerable acreage is in row crops. A significant acreage is in subdivision and urban developments. Erosion is the main limitation to the use of the soils for growing row crops.

## Broad Land Use Considerations

Deciding what land to use for urban development is an important concern of the county. Since the mid 1960's, an increasing number of persons who work in Louisville have moved into the county. Many of them have

Beasley-Caneyville and the Beasley-Cynthiana-Faywood associations. Commercially valuable trees grow rather slowly on these two associations. Equipment limitations are severe on these soils due to the steep slopes.

Most of the soil associations in the county have sufficient trees, grasses, and shrubs to provide adequate

a *soil phase* commonly indicates a feature that affects use or management. For example, Beasley silt loam, 2 to 6 percent slopes, is one of several phases within the Beasley series.

Some mapping units are made up of two or more dominant kinds of soil. One such kind of mapping unit is shown on the soil map of this survey area, the soil complex.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. Brassfield-Beasley silt loam, 20 to 30 percent slopes, is an example.

Most mapping units include small, scattered areas of soils other than those that appear in the name of the mapping unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the mapping unit. The soils that are included in mapping are recognized in the description of each mapping unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such

Included with this soil in mapping are small areas of Hagerstown, Lowell, and Nicholson soils. Also included are small areas of an eroded Beasley soil with a yellowish brown silty clay loam surface layer. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

This soil is medium in natural fertility and moderate in organic matter content. Except where it has been limed, it is very strongly to medium acid in the surface layer and upper part of the subsoil and neutral to moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is moderately slow and available water capacity is high. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions except in eroded spots where the surface layer is silty clay loam. The root zone is deep, but the clayey subsoil restricts root penetration for some plants.

Most of this soil is being used for pasture and hay crops, but some acreage is in row crops. Some small tracts are used for housing.

This soil has high potential for growing row crops and small grains, and good results can be expected if management is good. The soil has high potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff

soils. Also included are small areas of an eroded Beasley soil with a yellowish brown silty clay loam surface layer. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

This soil is medium in natural fertility and moderate in organic matter content. Except where it has been limed, it is very strongly to medium acid in the surface layer and upper part of the subsoil and neutral to moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is moderately slow and available water capacity is high. Tilth is good, and the soil

soil with a yellowish brown silty clay loam surface layer. Included soils make up 10 to 15 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

This soil is medium in natural fertility and moderate in organic matter content. Except where it has been limed, it is very strongly to medium acid in the surface layer and upper part of the subsoil and neutral to moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is moderately slow and available water capacity is high. Tilth is good, and the soil can be worked throughout a wide range of moisture con-

Beasley soil that has a brown silt loam surface layer. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

This soil is low in natural fertility and organic matter content. Except where it has been limed, it is very strongly to medium acid in the surface layer and upper part of the subsoil and neutral to moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is moderately slow and available water capacity is high. This soil has somewhat unfavorable tilth and can be worked only within a narrow range of moisture conditions. The root zone is deep, but the clayey subsoil restricts root penetration for some plants.

Most of this soil is being used for pasture and hay crops. Some small tracts are used for housing. A few areas are idle. Vegetation in the idle areas is being reestablished naturally.

This soil has low potential for growing row crops and small grains. It has medium potential for hay and pasture. Good tilth is difficult to maintain, but it can be improved by returning crop residue to the soil. Erosion is a very severe hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion. Small seep spots are a problem in some areas, but the problem can be corrected by improved surface or tile drainage where suitable outlets are available.

This soil has moderate potential for woodland. It has severe equipment limitations.

This soil has medium potential for most urban uses. Slope, low strength, moderate shrink swell potential, and the clayey subsoil are limitations, but they can be overcome by good design and careful installation. The clayey subsoil percs slowly, and this limits the use of this soil for septic tank absorption fields. Vegetation is difficult to establish due to the silty clay loam surface layer. Capability subclass IVe; woodland ordination symbol 4c.

**Bfd3—Beasley silty clay loam, 12 to 20 percent slopes, severely eroded.** This deep, well drained, severely eroded, moderately steep soil is on complex side slopes mostly in the eastern half of the county. Slopes are 100 to 300 feet in length. Individual areas are 5 to 50 acres. Some areas have rills and shallow gullies 4 to 12 inches deep and 50 to 150 feet apart.

Typically, the surface layer is yellowish brown friable silty clay loam about 5 inches thick. The upper part of the subsoil, to a depth of about 15 inches, is yellowish brown silty clay that is firm when moist and sticky and plastic when wet. The lower part, to a depth of about 29 inches, is yellowish brown clay with gray mottles. It is very firm when moist and sticky and plastic when wet. The underlying material is firm brown and gray moderately alkaline silty clay with about 20 percent coarse fragments 1/8 to 1/2 inch in diameter.

Included with this soil in mapping are small areas of Brassfield, Caneyville, Cynthiana, Faywood, Hagerstown, and Lowell soils. Also included are narrow areas of Lind-

side, Newark, and Nolin soils along small drainageways. Small areas of less eroded Beasley soils with brown silt loam surface layers are included. Included soils make up 10 to 15 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

This soil is low in natural fertility and organic matter content. Except where it has been limed, it is very strongly to medium acid in the surface layer and upper part of the subsoil and neutral to moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is moderately slow, and available water capacity is high. This soil has somewhat unfavorable tilth and can be worked only within a narrow range of moisture conditions. The root zone is deep, but the clayey subsoil may restrict root penetration for some plants.

Most of this soil is being used for pasture, but some acreage is low quality woodland. Some small tracts are used for housing. A few areas are idle, and vegetation in these areas is being reestablished naturally.

This soil has low potential for growing row crops and small grains. It has medium potential for pasture. Good tilth is difficult to maintain.

This soil has medium potential for woodland. It has severe equipment limitations.

This soil has low potential for most urban uses. Slope is the greatest limitation, but low strength, moderate shrink swell potential, and the clayey subsoil are other less significant limitations. The clayey subsoil percs slowly, and this limits the use of this soil for septic tank absorption fields. Vegetation is difficult to establish due to the silty clay loam surface layer. Capability subclass VIe; woodland ordination symbol 4c.

**BnF—Beasley-Caneyville rocky silt loams, 30 to 60 percent slopes.** This complex consists of areas of Beasley and Caneyville soils so intermingled that it was not feasible to separate them at the scale selected for mapping. These soils are on steep hillsides and very steep bluffs along the Ohio River and Harrods Creek and their tributaries. Generally, the Beasley soil is on the lower slopes and the Caneyville soil is on the middle and upper slopes. Slopes are 100 to 400 feet in length, and areas are 10 to 200 acres. Individual areas of each soil are 1 to 10 acres. Limestone outcrops cover about 1 to 6 percent of the surface.

Beasley soil makes up about 40 percent of each mapped area. Typically the surface layer is brown, very friable silt loam about 5 inches thick. The upper part of the subsoil, to a depth of about 20 inches, is yellowish brown silty clay. It is firm when moist and sticky and plastic when wet. The lower part of the subsoil, to a depth of about 34 inches, is yellowish brown clay with gray mottles. It is very firm when moist and sticky and plastic when wet. The underlying material is firm, brown and gray, moderately alkaline silty clay and about 20 percent coarse fragments 1/8 to 1/2 inch in diameter.

The Beasley soil is medium in natural fertility and moderate in organic matter content. It is very strongly to medium acid in the upper part of the subsoil and neutral

to moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is moderately slow, and available water capacity is high. The root zone is deep, but the clayey subsoil may restrict root penetration of some plants.

Caneyville soil makes up about 30 percent of each mapped area. Typically, the surface layer is brown, very friable silt loam about 5 inches thick. The upper part of the subsoil, to a depth of about 12 inches, is reddish brown, slightly firm silty clay loam. The lower part, to a depth of about 31 inches, is reddish brown silty clay or

moisture conditions. The root zone is moderately deep and is easily penetrated by plant roots.

This soil is used mostly for hay and pasture. A few areas are in row crops and woodland.

This soil has medium potential for growing row crops, and good results can be expected if management is good. It has high potential for hay and pasture. Flooding is a hazard in winter and spring. Good tilth is easily maintained by returning crop residue to the soil.

This soil has high potential for woodland and has only slight equipment limitations. It has low potential for most urban uses. Flooding is the greatest limitation and is very

Included with this complex in mapping are small areas of Cynthiana and Faywood soils. Also included is a dark surfaced clayey soil that is calcareous throughout and is underlain by soft calcareous siltstone, shale, and limestone at depths of 12 to 30 inches. In spots, flagstones and channery fragments cover 3 to 15 percent of the surface. A few areas where slopes are 30 to 40 percent are also included.

This complex is being used mostly for woodland. Some areas are used for pasture, generally of low quality. A few areas are idle and are being revegetated naturally.

This complex has very low potential for farming and urban uses. Steepness is the greatest limitation and is very difficult to overcome. Plants adapted only to acid to neutral soil conditions do not grow well on the Brassfield component of this complex due to its alkaline properties.

This complex has low potential for woodland and has moderate equipment limitations. Capability subclass IIIe;

This soil has medium potential for woodland and has moderate equipment limitations.

This soil has medium potential for urban uses. Slope, depth to bedrock, low strength, moderate shrink swell potential, and clayey subsoils are limitations. Some of these can be overcome by good design and careful installation. The clayey subsoil percs slowly, and this limits use for septic tank absorption fields. Capability subclass IIIe; woodland ordination symbol 3c.

**CbD—Caneyville-Beasley rocky silt loams, 12 to 30 percent slopes.** This complex consists of areas of Caneyville and Beasley soils so intermingled that it was not feasible to separate them at the scale selected for mapping. It occurs on convex, moderately steep and steep hillsides mostly in the western half of the county. Generally, the Caneyville soil is on the upper and middle slopes and the Beasley soil is on the lower and middle slopes. Slopes are 100 to 400 feet in length and areas are

Included with this complex in mapping are small areas of Brassfield, Crider, Faywood, and Hagerstown soils. A clayey soil, with a reddish brown subsoil that is less than 20 inches to limestone bedrock, is included. Also included is a clayey soil that has a dark surface layer and is 12 to 30 inches to interbedded soft calcareous siltstone, shale, and limestone. A few small eroded spots with a silty clay loam surface layer are included.

This complex is used mostly for woodland, but a few areas are in low quality pasture or are idle. It has medium potential for woodland and has severe equipment limitations.

This complex has low potential for farming and urban uses. Moderately steep and steep slopes, depth to bedrock, and rockiness are limitations that are very difficult to overcome. Capability subclass VI<sub>2</sub>; woodland ordination symbol 3c.

**CrA—Crider silt loam, 0 to 2 percent slopes.** This deep, well drained, nearly level soil is on ridgetops, mostly in the western half of the county. Slopes are 150 to 400 feet in length. Individual areas are 10 to 80 acres.

Typically, the surface layer is brown, very friable silt loam about 7 inches thick. The upper part of the subsoil, to a depth of about 40 inches, is brown, friable silty clay loam. The lower part, to a depth of 60 inches or more, is dark red, firm, silty clay loam or silty clay.

Included with this soil in mapping are small areas of Nicholson soils. Included soils make up 3 to 6 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

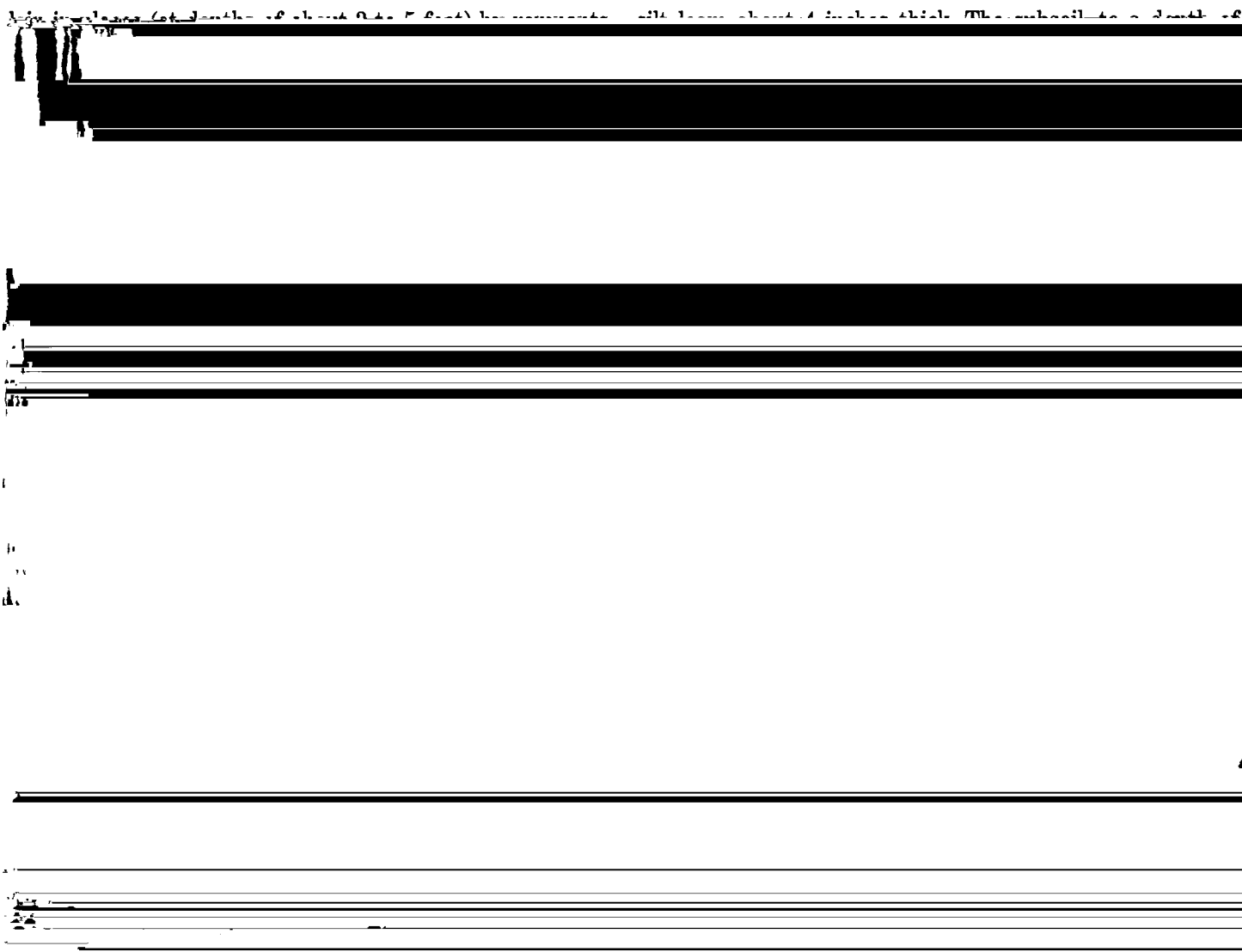
Typically, the surface layer is brown very friable silt loam about 7 inches thick. The upper part of the subsoil, to a depth of about 40 inches, is brown friable silty clay loam. The lower part of the subsoil, to a depth of 60 inches or more, is dark red, firm, silty clay loam or silty clay.

Included with this soil in mapping are small areas of Beasley, Hagerstown, and Nicholson soils. Near slightly depressed areas, small areas of Lindsie and Nolin soils are inclusions. Some areas northwest of U.S. Highway 42 have a loamy upper mantle deeper than 45 inches. An area approximately 1 to 4 miles wide that lies along U.S. Highway 42, roughly from Goshen to Covington Church, is underlain in places at depths of about 3 to 5 feet, by remnants considered to be glacial deposits. Also included are small eroded spots with a silty clay loam surface layer. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

This soil is high in natural fertility and moderate in organic matter content. Except where the surface layer has been limed, reaction is slightly to strongly acid in the upper 40 inches and medium to strongly acid below. Permeability is moderate and available water capacity is high. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Most of this soil is being used for row crops or hay, but a significant acreage is in subdivisions and small tracts.

This soil has high potential for growing row crops and small grains, and very good results can be obtained under



considered to be glacial deposits. Also included are small eroded spots with a silty clay loam surface layer. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

This soil is high in natural fertility and moderate in organic matter content. Except where the surface layer has been limed, reaction is slightly to strongly acid in the upper 40 inches and medium to strongly acid below. Permeability is moderate, and available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Most of this soil is being used for row crops, hay, and pasture. Some horse farms are on this soil.

This soil has high potential for growing row crops and small grains, and good results can be obtained under good management. It has high potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a severe hazard if cultivated crops

about 31 inches, is yellowish brown silty clay or clay that is firm when moist and sticky and plastic when wet. Limestone bedrock is at a depth of about 31 inches.

The Faywood soil is medium in natural fertility and moderate in organic matter content. It is strongly acid to neutral throughout. Permeability is moderately slow or slow, and available water capacity is moderate. The root zone is moderately deep, and the clayey subsoil may restrict root penetration for some plants.

Beasley soil makes up about 25 percent of each mapped area. Typically, the surface layer is brown very friable silt loam about 5 inches thick. The upper part of the subsoil, to a depth of about 20 inches, is yellowish brown silty clay that is firm when moist and sticky and plastic when wet. The lower part, to a depth of about 34 inches, is yellowish brown clay with gray mottles. It is very firm when moist and sticky and plastic when wet. The underlying material is firm, brown and gray, moderately alkaline silty clay with about 20 percent coarse fragments 1/8 to 1/2 inch in diameter.

Included with this soil in mapping are small areas of Huntington, Newark, and Otwell soils. A few low terraces along the Ohio River have dark surface layers. In places slopes are 0 to 2 percent, and in other places they are short and 6 to 12 percent. Also included are a few areas where the surface layer is fine sandy loam. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 2 acres in size.

This soil is high in natural fertility and moderate in organic matter content. Except where it has been limed, it is medium to very strongly acid in the surface layer and subsoil and slightly to strongly acid in the underlying material. Permeability is moderate and available water capacity is high. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

This soil has medium potential for growing row crops and small grains. Moderately good results can be obtained under good management. The soil has medium potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion.

This soil has medium potential for woodland and severe equipment limitations. It has medium potential for urban uses. Slope, depth to bedrock, low strength, moderate shrink swell potential, and the clayey subsoil are limitations. Some of these can be overcome by good design and careful installation. The clayey subsoil percs slowly, and this limits its use for septic tank absorption fields. Cons-

Typically, the surface layer is yellowish brown, slightly firm silty clay about 4 inches thick. The subsoil, to a depth of about 27 inches, is yellowish brown silty clay or clay that is firm when moist and sticky and plastic when wet. Limestone bedrock is at a depth of about 27 inches.

Included with this soil in mapping are small areas of Beasley, Brassfield, Cynthiana, and Lowell soils. A few 30 to 40 percent slopes are present. Included soils make up 5 to 10 percent of this mapping unit, but separate areas are generally less than 3 acres in size.

This soil is low in natural fertility and organic matter content. It is strongly acid to neutral throughout. Permeability is moderately slow, and available water capacity is moderate. This soil has somewhat unfavorable tilth and can be worked only within a narrow range of moisture conditions. The root zone is moderately deep and the clayey subsoil may restrict root penetration for some plants.

Most of this soil is being used for pasture. A few areas are being revegetated naturally.

This soil has low potential for farming and urban uses, mainly because of the moderately steep slopes and depth to bedrock.

This soil has medium potential for woodland and has severe equipment limitations. Capability subclass VIe; woodland ordination symbol 4c.

**HaB—Hagerstown silt loam, 2 to 6 percent slopes.** This deep, well drained, gently sloping soil is on uniform, convex ridgetops. It's mostly in the western half of the county. Slopes are 75 to 300 feet in length. Individual areas are 3 to 15 acres.

Typically, the surface layer is brown, very friable silt loam about 5 inches thick. The upper part of the subsoil, to a depth of about 16 inches, is yellowish red friable silty clay loam. The lower part, to a depth of about 60 inches,

good management. It has high potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion.

This soil has high potential for woodland and only slight equipment limitations. It has high potential and no significant limitations for urban uses. Capability subclass IIe; woodland ordination symbol 1o.

**HaC—Hagerstown silt loam, 6 to 12 percent slopes.** This deep, well drained, sloping soil is on convex ridgetops and side slopes mostly in the western half of the county. Slopes are 75 to 300 feet in length. Individual areas are 4 to 60 acres.

Typically, the surface layer is brown, very friable silt loam about 5 inches thick. The upper part of the subsoil, to a depth of about 16 inches, is yellowish red friable silty clay loam. The lower part, to a depth of about 60 inches, is red or dark red silty clay that is firm when moist and sticky and plastic when wet. The underlying material is dark red silty clay that is firm when moist and sticky and plastic when wet.

Included with this soil in mapping are small areas of Beasley, Caneyville, and Crider soils. Also included are small eroded spots with a yellowish red silty clay loam surface layer. A few 12 to 18 percent slopes are included. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 2 acres in size.

This soil is high in natural fertility and moderate in organic matter content. It is medium to strongly acid in the upper part of the subsoil and strongly acid to neutral below that. Permeability is moderate, and available water

is red or dark red silty clay that is firm when moist and sticky and plastic when wet. The underlying material is dark red silty clay that is firm when moist and sticky and plastic when wet.

Included with this soil in mapping are small areas of Beasley, Caneyville, and Crider soils. Also included are small eroded spots with a yellowish red silty clay loam surface layer. Included soils make up 4 to 8 percent of this mapping unit, but separate areas generally are less than 2 acres in size.

capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions except in eroded spots where the silty clay loam subsoil is exposed. The root zone is deep and easily penetrated by plant roots.

Most of this soil is being used for row crops, hay, and pasture. Some small tracts are used for housing.

This soil has high potential for growing row crops and small grains, and good results can be expected if management is good. It has high potential for hay and pasture.

It is mostly in the western half of the county. Slopes are 75 to 300 feet in length. Individual areas are 4 to 35 acres.

Typically, the surface layer is yellowish red friable silty clay loam about 5 inches thick. The upper part of the subsoil, to a depth of about 11 inches, is yellowish red friable silty clay loam. The lower part, to a depth of about 55 inches, is red or dark red silty clay that is firm when moist and sticky and plastic when wet. The underlying material is dark red silty clay that is firm when moist and sticky and plastic when wet.

Included with this soil in mapping are small areas of Beasley, Caneyville, and Crider soils. Also included are a few small areas where the soil is less eroded and has a brown silt loam surface layer. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 2 acres in size.

This soil is medium in natural fertility and low in organic matter content. It is medium to strongly acid in the upper part of the subsoil and strongly acid to neutral below that. Permeability is moderate, and available water capacity is high. This soil has somewhat unfavorable tilth and can be worked only within a narrow range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Most of this soil is being used for pasture and hay. A few areas are in row crops.

This soil has low potential for growing row crops and small grains. It has medium potential for hay and pasture. Good tilth is difficult to maintain, but it is improved by returning crop residue to the soil. Erosion is a very severe hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion.

This soil has high potential for woodland and has slight equipment limitations. It has medium potential for most

is moderate, and available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

This soil is being used for row crops, hay, and pasture. It has high potential for growing row crops, and very good results can be expected under good management. It has high potential for hay and pasture except for the hazard of flooding in late winter and early spring. Good tilth is easily maintained by returning crop residue to the soil.

This soil has high potential for woodland and has only slight equipment limitations. It has low potential for most urban uses. Flooding is the greatest limitation and is very difficult to overcome. Capability class I; woodland ordination symbol 10.

**La—Lawrence silt loam.** This deep, somewhat poorly drained, nearly level soil is on broad upland flats throughout the county. Individual areas are 4 to 70 acres. Slopes range from 0 to 4 percent.

Typically, the surface layer is grayish brown very friable silt loam about 8 inches thick. The upper part of the subsoil, to a depth of about 22 inches, is yellowish brown friable silty clay loam with brownish gray mottles. The very firm, brittle and compact silty clay loam fragipan, between depths of about 22 and 38 inches, is mottled light brownish gray and yellowish brown. The lower part of the subsoil and underlying material are yellowish brown, firm silty clay loam or silty clay with common gray mottles.

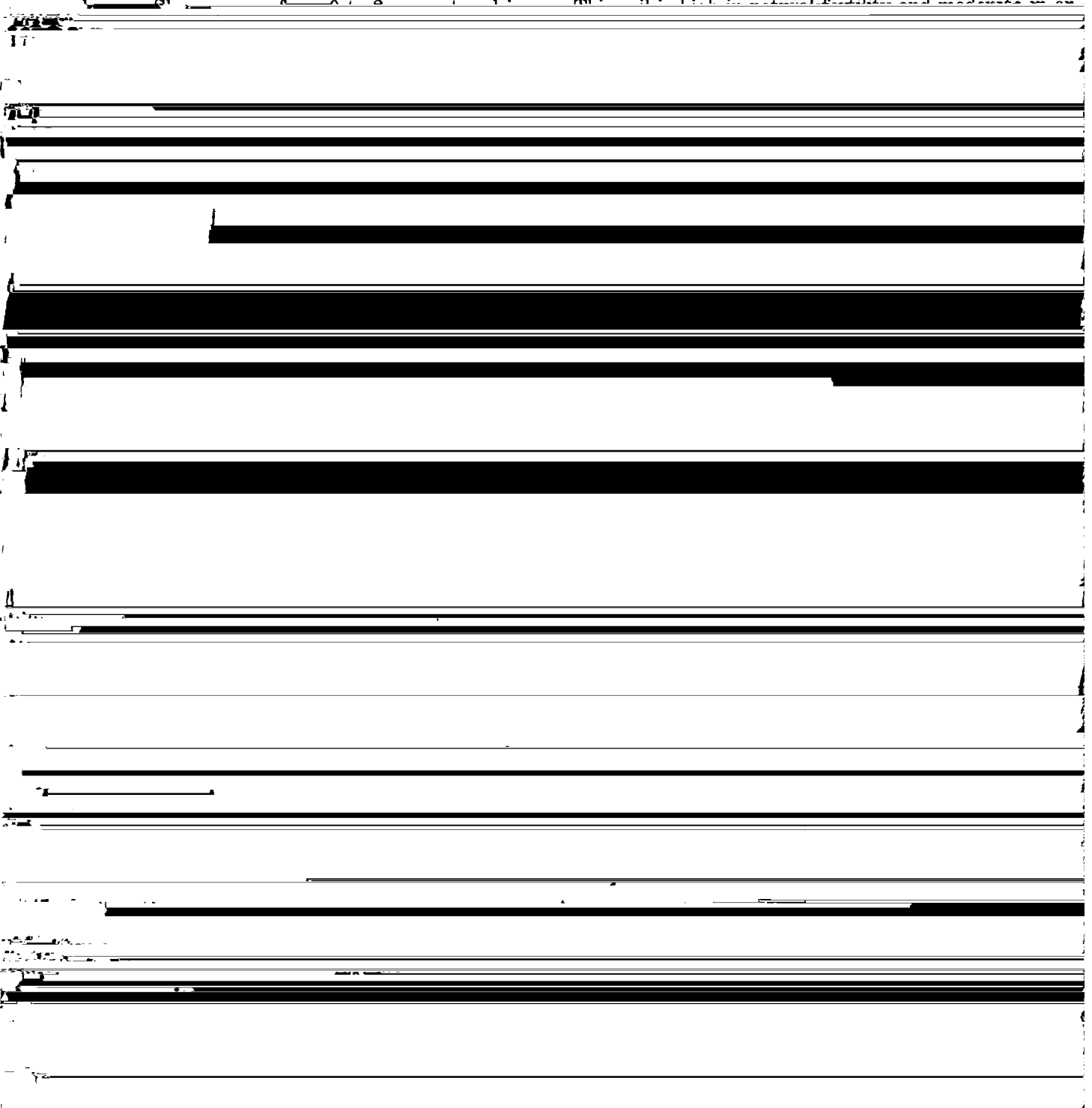
Included with this soil in mapping are small areas of Newark and Nicholson soils. A poorly drained soil that is clayey in the subsoil and lacks a fragipan is also included. In places this soil is underlain, at a depth of 3 to 5 feet, by remnants considered to be glacial deposits. Included soils make up 10 to 15 percent of this mapping unit, but

strength are limitations which are difficult to overcome. The compact and brittle fragipan percs slowly, and this limits use for septic tank absorption fields. Capability subclass IIIw; woodland ordination symbol 2w.

**Ln—Lindside silt loam.** This deep, moderately well drained, nearly level soil is on flood plains along major streams and their tributaries. A few areas are around small depressions in the uplands. It usually floods at least

sticky and plastic when wet. Limestone bedrock is at a depth of 59 inches.

Included with this soil in mapping are small areas of Beasley, Faywood, and Nicholson soils. Also included are small areas where the soil is eroded and has a dark yellowish brown silty clay loam surface layer. Included soils make up 4 to 8 percent of this mapping unit, but separate areas generally are less than 2 acres in size.



This soil is high in natural fertility and moderate in organic matter content. Except where it has been limed, it is slightly to very strongly acid in the surface layer and

somewhat unfavorable tilth and can be worked only within a narrow range of moisture conditions. The root zone is deep, but the clayey subsoil restricts root penetra-

upper part of the subsoil and strongly acid to mildly alkaline in the lower part of the subsoil. Permeability is moderately slow, and available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions except in eroded spots where the silty clay loam subsoil is exposed. The root zone is deep, but the clayey subsoil restricts root penetration for some plants.

This soil is being used mostly for row crops, hay, and pasture. It has medium potential for growing row crops and small grains, and good results can be expected under good management. It has high potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion.

This soil has high potential for woodland and has moderate equipment limitations.

This soil has medium potential for most urban uses. Slope, low strength, moderate shrink-swell potential, and the clayey subsoil are limitations, but they can usually be overcome by good design and careful installation procedures. The clayey subsoil percs slowly, and this limits its use for septic tank absorption fields. Capability subclass IIIe; woodland ordination symbol 2c.

**LsC3—Lowell silty clay loam, 6 to 12 percent slopes, severely eroded.** This deep, well drained, severely eroded, sloping soil is on convex ridgetops and side slopes, mostly

in the southeastern portion of the county. Slopes are 75 to 300 feet in length. Individual areas are 3 to 40 acres. Some areas have rills and shallow gullies 4 to 12 inches deep and 50 to 150 feet apart.

Typically, the surface layer is dark yellowish brown friable silty clay loam about 6 inches thick. The subsoil, to a depth of about 30 inches, is strong brown or yellowish brown silty clay or clay that is firm when moist and sticky and plastic when wet. The underlying material is mottled yellowish brown and strong brown clay that is very firm when moist and sticky and plastic when wet. Limestone bedrock is at a depth of 53 inches.

Included with this soil in mapping are small areas of Beasley, Cynthia, Faywood, and Nicholson soils. A few short 12 to 20 percent slopes are included. Also included are small areas where the soil is less eroded and has a brown silt loam surface layer. Included soils make up 5 to

tion for some plants.

This soil is being used mostly for hay and pasture. It has low potential for growing row crops and small grains. It has medium potential for hay and pasture. Good tilth is difficult to maintain, but it is improved by returning crop residue to the soil. Erosion is a very severe hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion.

This soil has high potential for woodland, but it has moderate equipment limitations. It has low potential for most urban uses. Slope, low strength, moderate shrink-swell potential, and the clayey subsoil are limitations, but they can usually be overcome by good design and careful installation procedures. The clayey subsoil percs slowly, and this limits use for septic tank absorption fields. Vegetation is difficult to establish because of the clayey surface layer. Capability subclass IVe; woodland ordination symbol 2c.

**Ne—Newark silt loam.** This deep, somewhat poorly drained, nearly level soil is on flood plains along major streams and their tributaries. It usually floods at least once each year. Slopes range from 0 to 2 percent. Individual areas are 4 to 25 acres.

Typically, the surface layer is brown, very friable silt loam. The upper part of the subsoil, to a depth of about 15 inches, is brown, very friable silt loam with many light brownish gray mottles. The lower part, to a depth of about 38 inches, is grayish brown and light brownish gray

friable silt loam with common to many brown and yellowish brown mottles. The underlying material is mottled, light brownish gray and yellowish brown, friable silt loam.

Included with this soil in mapping are small areas of Huntington, Lindsie, Nolin, and Weinbach soils. Also included are a few areas of poorly and very poorly drained soils. The included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 2 acres in size.

This soil is high in natural fertility and moderate in organic matter content. Reaction is medium acid to mildly alkaline. Permeability is moderate, and available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

This soil is being used mostly for row crops, hay, and

This soil has high potential for woodland and has moderate equipment limitations. It has low potential for most urban uses. Flooding is the greatest limitation and is very difficult to overcome. The seasonal high water table can be corrected if suitable outlets are available. Capability subclass IIw; woodland ordination symbol 1w.

**NhB—Nicholson silt loam, 2 to 6 percent slopes.** This deep, moderately well drained, gently sloping soil is on uniform convex ridgetops throughout the county. Slopes are 75 to 200 feet in length and individual areas are 3 to 45 acres.

Typically, the surface layer is brown friable silt loam about 7 inches thick. The upper part of the subsoil, to a depth of about 27 inches, is brown or strong brown friable silt loam or silty clay loam. Between depths of about 27 and 36 inches is a yellowish brown, firm, brittle, compact silty clay loam fragipan with common gray mottles. The lower part of the subsoil and underlying material is yellowish brown silty clay or clay that has common gray mottles and is very firm when moist and sticky and plastic when wet.

Included with this soil in mapping are small areas of Beasley, Lawrence, and Lowell soils. A few 0 to 2 percent slopes are included. In places this soil is underlain, at a depth of 3 to 5 feet, by remnants considered to be glacial

**NhC—Nicholson silt loam, 6 to 12 percent slopes.** This deep, moderately well drained, sloping soil is on uniform convex ridgetops and side slopes throughout the county. Slopes are 75 to 300 feet in length and individual areas are 4 to 75 acres.

Typically, the surface layer is brown, friable silt loam about 7 inches thick. The upper part of the subsoil, to a depth of about 27 inches, is brown or strong brown, friable silt loam or silty clay loam. Between depths of about 27 and 36 inches is a yellowish brown, firm, brittle, compact silty clay loam fragipan with common gray mottles. The lower part of the subsoil and underlying material are yellowish brown silty clay or clay that has common gray mottles and is very firm when moist and sticky and plastic when wet.

Included with this soil in mapping are small areas of Beasley, Faywood, and Lowell soils. A few 12 to 18 percent slopes are included. In places this soil is underlain, at depths of 3 to 5 feet, by remnants considered to be glacial deposits. Also included are small areas where the soil is eroded and has a brown or strong brown silty clay loam surface layer. A few small areas have bedrock at depths of less than 60 inches. Included soils make up 5 to 10 percent of this mapping unit, but separate areas generally are less than 3 acres in size.

Slopes range from 0 to 2 percent. Individual areas are 5 to 150 acres.

Typically, the surface layer is brown, very friable silt loam about 8 inches thick. The upper part of the subsoil, to a depth of about 61 inches, is brown friable silt loam. The lower part of the subsoil and the underlying material are brown, friable silt loam with common grayish brown mottles and a few small pebbles.

Included with this soil in mapping are small areas of Boonesboro, Elk, Lindside, and Woolper soils. In places small areas of Huntington soils are also included. The in-

This soil is medium in natural fertility and moderate in organic matter content. It is neutral to very strongly acid in the upper part of the subsoil, very strongly to strongly acid in the fragipan, medium to very strongly acid in the lower part of the subsoil, and neutral to very strongly acid in the underlying material. Permeability is slow in the fragipan, and available water capacity is moderate. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is moderately deep, but the compact and brittle fragipan restricts root penetration for some plants.

the surface layer and subsoil are medium to very strongly acid, and the underlying material is strongly or very strongly acid. Permeability is slow in the fragipan, and available water capacity is moderate. This soil is a

This soil has high potential for woodland and only slight equipment limitations. It has high potential for urban uses and has no significant limitations except for a few

tilth and can be worked throughout a wide range of moisture conditions. The root zone is moderately deep, and the compact and brittle fragipan restricts root penetration for most plants.

Most of this soil is being used for row crops, hay, and pasture. A small acreage is in woodland.

This soil has medium potential for growing row crops, and moderately good results can be expected under good management. It has medium potential for hay and pasture, but selection of water tolerant plants is essential. Good tilth is easily maintained by returning crop residue to the soil.

This soil has high potential for woodland and moderate equipment limitations. It has low potential for most urban uses. Seasonal wetness, slow permeability, and low

class I; woodland ordination symbol 20.

**WhB—Wheeling silt loam, 2 to 6 percent slopes.** This deep, well drained, gently sloping soil is on uniform stream terraces along the Ohio River. Slopes are 75 to 200 feet in length. Individual areas are 3 to 45 acres.

Typically, the surface layer is brown, very friable silt loam about 10 inches thick. The upper part of the subsoil, to a depth of about 28 inches, is dark yellowish brown and brown, friable silty clay loam. The lower part, to a depth of about 46 inches, is brown, friable loam with gravel in the lower part. The underlying material is dark yellowish brown, friable gravelly sandy loam.

Included with this soil in mapping are small areas of Elk, Newark, Otwell, and Weinbach soils. Also included are small areas of a soil that is more sandy throughout. Included soils make up 10 to 15 percent of this mapping

soil that is more sandy throughout. Included soils make up 10 to 15 percent of this mapping unit, but separate areas generally are less than 5 acres in size.

This soil is high in natural fertility and moderate in organic matter content. Except where it has been limed, it is medium to strongly acid in the surface layer and subsoil and neutral to strongly acid in the underlying material. Permeability is moderate, and available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

This soil is being used mostly for row crops, hay, and pasture. A small acreage is residential.

This soil has high potential for growing row crops and small grains and high yields can be obtained using good management. It has high potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion.

This soil has high potential for woodland but has slight equipment limitations.

This soil has medium potential for urban uses. Slope is a limitation, but this can be overcome by good design and careful installation procedures. A few low areas become flooded occasionally. Capability subclass IIIe; woodland

The root zone is deep and easily penetrated by plant roots.

These soils are being used mostly for pasture and hay. A few areas are in row crops and woodland. Others are idle and are being revegetated naturally.

This soil has low potential for growing row crops. It has medium potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a very severe hazard if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, are practices that help reduce runoff and control erosion.

This soil has high potential for woodland and moderate equipment limitations. It has low potential for urban uses. Moderately steep slopes are limitations that are very difficult to overcome. A few low areas become flooded occasionally. Capability subclass IVe; woodland ordination symbol 2r.

**WoB—Woolper silty clay loam, 2 to 6 percent slopes.** This deep, well drained, gently sloping soil is on concave toe slopes throughout the county. Slopes are 75 to 200 feet in length, and individual areas are 3 to 15 acres.

Typically, the surface layer is very dark grayish brown slightly firm silty clay loam about 7 inches thick. The upper part of the subsoil, to a depth of about 18 inches, is very dark grayish brown silty clay that is firm when moist and sticky and plastic when wet. The lower part, to a depth of about 40 inches, is yellowish brown silty clay

channels constructed around the base of the footslopes to divert runoff from the adjacent steep hillsides are necessary when row crops are grown. Small seep spots are a problem in some areas but this usually can be corrected by installing intercept drain tile where suitable outlets are available.

This soil has high potential for woodland but has moderate equipment limitations. It has medium potential for most urban uses. Low strength, moderate shrink-swell potential, and the clayey subsoil are limitations, but they can usually be overcome by good design and careful installation procedures. The clayey subsoil percs slowly and this limits the use of this soil for septic tank absorption fields. Capability subclass IIe; woodland ordination symbol 2c.

**WoC—Woolper silty clay loam, 6 to 12 percent slopes.** This deep, well drained, sloping soil is on concave toe slopes throughout the county. Slopes are 75 to 300 feet in length, and individual areas are 3 to 20 acres.

Typically, the surface layer is very dark grayish brown slightly firm silty clay loam, about 7 inches thick. The upper part of the subsoil, to a depth of about 18 inches, is very dark grayish brown silty clay that is firm when moist and sticky and plastic when wet. The lower part, to a depth of about 43 inches, is yellowish brown silty clay

by installing intercept drain tile where suitable outlets are available.

This soil has high potential for woodland and moderate equipment limitations.

This soil has medium potential for most urban uses. Slope, low strength, moderate shrink-swell potential, and the clayey subsoil are limitations, but they can usually be overcome by good design and careful installation procedures. The clayey subsoil percs slowly, and this limits the use of this soil for septic tank absorption fields. Capability subclass IIIe; woodland ordination symbol 2c.

## Use and Management of the Soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flood

closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

## Crops and Pasture

ROSCOE ISAACS, assistant State resource conservationist, Soil Conservation Service, assisted in preparing this section.

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are presented for each soil (17).

This section provides information about the overall agricultural potential of the survey area and about the needed management practices. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil Maps for Detailed Planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Approximately 83,000 acres in the county were used for crops and pasture in 1967, according to the Kentucky Soil and Water Conservation Needs Inventory (19). Of this

slopes of 2 to 12 percent. The Nicholson and Otwell soils have dominant slopes of 2 to 6 percent and an additional problem of wetness.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils with a clayey subsoil, such as the Beasley and Lowell soils, and on soils with a layer in or below the subsoil that limits the depth of the root zone. Such layers include fragipans as in Nicholson and Otwell soils, or bedrock as in Caneyville, Cynthiana, and Faywood soils. Soil erosion on farmland results in sediment entering streams. Control of erosion minimizes the pollution of streams by sediment and improves quality of water for municipal use, for recreation, and for fish and wildlife.

In many sloping fields, preparing a good seedbed and tilling are difficult on clayey soils because the original friable surface soil has been eroded away. Such areas are common in Beasley and Lowell soils that have 6 to 12 percent slopes.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration on the sloping cropland and pasture in Oldham County. A cropping system that keeps vegetative cover on the soil for extended periods generally holds soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms that require pasture and hay,

maize and legumes in the cropping system reduce ero-

tension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes climatically suited to the area and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use; they are defined as follows:

gions, the Mixed Mesophytic in eastern Kentucky and the Western Mesophytic over the rest of the State.

Oldham County is a part of the Western Mesophytic forest region and can be divided into several forest types. Approximately 95 percent of the forest acreage in the

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

county is classified as redcedar-hardwoods, oak-hickory, central mixed hardwoods, or elm-ash-cottonwood. These types differ from one another in slope, exposure, and such soil characteristics as fertility, depth, texture, drainage, and available moisture.

Oldham County has 22,000 acres of commercial forest covering 18.7 percent of the land area. Nearly half of this acreage is in the seedling-sapling size class. Volume growth is 22 cubic feet of growing stock and 84 board feet of sawtimber per year. Most wooded areas have the potential to produce 50 cubic feet (6, 7, 10, 11) of growing stock per acre per year. However, less than one-fourth of the forest area is well stocked with merchantable or potentially merchantable trees, and significant increases in productivity cannot be expected until tree stocking improves. Generally, tree growth exceeds harvesting for most of the important timber species.

There are no commercial sawmills in Oldham County. One mill, however, does custom work. The adjacent counties of Henry and Jefferson have commercial mills that purchase timber from Oldham County. These mills produce such products as lumber, posts, fuelwood, railroad crossties, veneer cants, and farm materials.

Table 7 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Mapping unit symbols for soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential

struction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

*Seedling mortality* ratings indicate the degree that the soil affects expected mortality of planted tree seedlings when plant competition is not a limiting factor. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

*Rating of plant competition* indicates the degree to

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, founda-

facilities; and table 11, for water management. Table 10 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

### Building Site Development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 8. A *slight* limitation indicates that soil properties are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible. In some low areas, the Elk, Otwell, Weinbach, and Wheeling soils are subject to occasional flooding. In these areas these soils have severe limitations for all building site development.

*Shallow excavations* are used for pipelines, sewerlines, telephone and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by the soil wetness of a high seasonal water table, the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is defined and the presence of very firm or

to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious limitation.

*Local roads and streets* referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

### Sanitary Facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*

extremely firm horizons, usually difficult to excavate, is indicated.

*Dwellings and small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high.

soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive main-

those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope may cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table could be installed or the size of the absorption field could be increased so that performance is satisfactory.

*Sewage lagoons* are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soils affect the performance of embankments.

*Sanitary landfill* is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with thin layers of soil. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness may be a limitation because operating heavy equipment on a wet soil is difficult. Seepage into the surface increases the risk

must be deep to bedrock and free of large stones and boulders. Where the seasonal water table is high, water seeps into trenches and causes problems in filling.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

*Daily cover for landfill* should be soil that is easy to excavate and spread over the compacted fill in wet and dry weather. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

## Construction Materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

*Roadfill* is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the

cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

*Sand and gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse, frag-

### Water Management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 11 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

*Embankments, dikes, and levees* require soil material

by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 12 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without base-

## Wildlife Habitat

WILLIAM H. CASEY, biologist, Soil Conservation Service, assisted in preparing this section.

The wildlife population of Oldham County is composed of an estimated 37 species of mammals, 43 species of reptiles and amphibians, and 107 kinds of breeding birds. It is probable that many of the more than 200 other birds that visit Kentucky each year can be found in Oldham County during certain seasons.

The kinds of wildlife most important to man are those that furnish recreation in the form of sport hunting or economic gain in the form of commercial trapping. In Oldham County, these are the cottontail rabbit, grey squirrel, fox squirrel, white-tailed deer, raccoon, red fox, mink, muskrat, bobwhite quail, mourning dove, woodcock, and various kinds of waterfowl. Although there is much overlap in the types of habitat required by these animals, the

and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of

of the surface layer, wetness, reaction, salinity, slope, and surface stoniness.

Shallow water areas are bodies of water that have an

in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

The estimated classification (Unified and AASHTO), without group index numbers, is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Francisco Dominguez

is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

*Liquid limit* and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified (2) and AASHTO (1) soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made

*Tortura* is described in table 14 in the standard terms

ble water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

*Soil reaction* is expressed as range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

*Shrink-swell potential* depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

*Risk of corrosion* pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to

*Hydrologic soil groups* are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to deep, moderately well drained to well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

*Flooding* is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods

seasonal high water table applies to undrained soils. Esti- residuum from interbedded soft limestone and calcareous

ish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or unconfined; and the depth of the water table.

the eastern half of the county on ridgetops and concave and convex side slopes. Slope ranges from about 2 to 60 percent, but is dominantly 6 to 12 percent.

Beasley soils are associated with the Brassfield, Caneville, Fairwood, Hazleton, Jewell, and Nicholas

on flood plains along the upper reaches of the smaller streams. Slope ranges from 0 to 2 percent.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak fine-granular structure; very friable; common roots; 6 to 8 percent soft weathered calcareous siltstone and sandstone fragments 1/8 to 1/4

plastic; common fine roots; thin nearly continuous clay films; few dark brown and black concretions; medium acid; clear wavy boundary.

B23t—22 to 31 inches; reddish brown (5YR 4/4) clay; common medium faint mottles of strong brown (7.5YR 5/6) and grayish brown (10YR 5/2); strong coarse subangular and angular blocky structure; very firm, sticky and plastic; few fine roots; thin nearly continuous clay films; common dark brown and black concretions; common angular fragments of chert 1/4 to 3/4 inch in diameter, in the lower 3 inches; medium acid; clear smooth boundary.

R—31 inches; hard limestone bedrock.

Solum thickness and depth to limestone bedrock range from 20 to 40 inches. Fragments of chert 1/8 to 3 inches in diameter range from 0 to 15 percent in the solum. Reaction ranges from medium acid to neutral in the solum.

The Ap horizon has hues of 10YR or 7.5YR, a value of 4, and chromas of 2 through 4. Texture is silt loam or silty clay loam. Some pedons have A1 horizons 2 to 5 inches thick that have values of 3 through 5 and chromas of 2 or 3.

The B21t horizon has a hue of 5YR, values of 4 or 5, and chromas of 4 through 6. Texture is silty clay loam, silty clay, or clay.

The B22t and B23t horizons have hues of 5YR through 10YR, values of 4 or 5, and chromas of 4 through 6. Some pedons have mottles in shades of brown, red, or gray, but the gray mottles are below the upper 10 inches of the argillic horizon. Texture is silty clay or clay.

Some pedons have B3 or C horizons with color and texture ranges similar to those of the B22t and B23t horizons.

Soils with B21t horizons of 7.5YR or 10YR hues were considered Caneyville in naming the mapping units. Their behavior is enough like that of Caneyville soils that nothing would be gained by adding another series name.

## Crider Series

The Crider series consists of deep, well drained soils that have moderate permeability. They formed in a loess mantle and the underlying limestone residuum. Crider soils are mostly in the western half of the county on convex ridgetops and side slopes. Some areas are karst. Slope ranges from 0 to 12 percent but is dominantly 2 to 6 percent.

The Crider soils are associated with the Beasley, Caneyville, Hagerstown, Lawrence, and Nicholson soils. All but the Lawrence and Nicholson soils are more clayey in the upper part of the B horizon. Beasley soils are formed in residuum from interbedded, soft, calcareous siltstone, sandstone, shale, and limestone. Caneyville soils are underlain by hard limestone at depths of 20 to 40 inches. Lawrence and Nicholson soils are wetter than Crider soils and have a fragipan.

Typical pedon of Crider silt loam in an area of Crider silt loam, 2 to 6 percent slopes, approximately 200 feet west of the junction of Kentucky Highways 329 and 1694, and 150 feet south of Kentucky Highway 1694:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; neutral; clear smooth boundary.

B1—7 to 13 inches; brown (7.5YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; few thin patchy clay films; many fine roots; slightly acid; gradual smooth boundary.

B21t—13 to 30 inches; brown (7.5YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common thin patchy clay films; medium acid; gradual smooth boundary.

B22t—30 to 40 inches; reddish brown (5YR 4/4) silty clay loam with a few mottles of strong brown (7.5YR 5/6); moderate medium suban-

gular blocky structure; friable; few fine roots; common thin patchy clay films; medium acid; clear wavy boundary.

IIB23t—40 to 59 inches; dark red (2.5YR 3/6) silty clay loam with a few mottles of strong brown (7.5YR 5/6); moderate medium and coarse subangular blocky structure; firm; thin nearly continuous clay films; common dark brown stains; strongly acid; gradual wavy boundary.

IIB24t—59 to 98 inches; dark red (2.5YR 3/6) silty clay; strong fine and medium subangular blocky structure; firm, sticky and plastic; common thin nearly continuous clay films; few small dark brown concretions; few small angular chert fragments 1/8 to 1/2 inch in diameter; strongly acid.

Solum thickness ranges from 60 to more than 100 inches. Depth to limestone bedrock ranges from 60 to more than 160 inches. Thickness of the loess mantle ranges from 20 to 45 inches. Angular chert fragments range from 0 to 15 percent in the lower solum below the loess mantle. Except where the soil has been limed, reaction ranges from slightly to strongly acid in the upper 40 inches and from medium to strongly acid below 40 inches.

The Ap horizon has hues of 10YR or 7.5YR, value of 4, and chroma of 2 through 4. Texture is silt loam except for some severely eroded areas which are silty clay loam.

The B1 horizon has hues of 7.5YR or 10YR and a value and chroma of 4. Texture is silt loam or silty clay loam.

The B21t horizon has a hue of 7.5YR, values of 4 or 5, and chromas of 4 or 6. Texture is silt loam or silty clay loam.

The B22t horizon has hues of 7.5YR or 5YR, a value of 4, and chromas of 4 through 8. Some pedons have strong brown or yellowish brown mottles. Texture is silt loam or silty clay loam.

The IIB2t horizon has hues of 5YR through 10R, values of 3 through 5, and chromas of 4 through 6. Some pedons have mottles in shades of brown, yellow, or gray. Texture is silty clay loam, silty clay, or clay.

Some pedons have IIB3 or IIC horizons that have color and texture ranges similar to those of the IIB2t horizon.

## Cynthiana Series

The Cynthiana series consists of shallow, well drained soils that have moderately slow permeability. They formed in clayey limestone residuum. The Cynthiana soils are mostly in the northeastern portion of the county on complex hillsides. Slopes range from 30 to 60 percent.

Cynthiana soils are associated with the Beasley, Faywood, and Lowell soils. Beasley soils are deep and have a paralithic contact with clayey shale below 40 inches. Faywood and Lowell soils formed in similar materials but are deeper to hard limestone bedrock.

Typical pedon of Cynthiana silty clay loam in an area of Cynthiana-Faywood-Beasley complex, 30 to 60 percent slopes, 1.5 miles southeast of Ballardsville, 0.5 mile south of Kentucky Highway 22, and 185 yards south of the East Fork of Floyds Fork:

Ap—0 to 5 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; 5 percent coarse fragments 1/8 to 1/2 inch in diameter; neutral; clear smooth boundary.

Bt—5 to 17 inches; yellowish brown (10YR 5/4) silty clay; many fine and medium distinct mottles of light yellowish brown (10YR 6/4); moderate medium angular blocky structure; firm, plastic and sticky; nearly continuous clay films; 10 to 15 percent fragments of limestone 1/4 to 3/4 inch in diameter; mildly alkaline.

R—17 inches; limestone bedrock.

Solum thickness and depth to bedrock range from 10 to 20 inches. Thin, flat limestone and shale fragments 1 to 24 inches in diameter range from 0 to 30 percent in the Ap horizon and from 5 to 30 percent in the Bt horizon. Reaction ranges from slightly acid to mildly alkaline throughout the profile.

The Ap horizon has hues of 10YR or 2.5Y, a value of 4, and chromas of 2 through 4. Texture is silt loam, silty clay loam, or silty clay. Some pedons have an A1 horizon less than 4 inches thick with a value of 3 or less.

The Bt horizon has hues of 10YR through 5Y, values of 4 or 5, and

The Ap horizon has hues of 10YR or 7.5YR, values of 4 or 5, and chromas of 2 through 4. Texture is mostly silt loam but ranges from loam to silty clay loam.

The B horizon has hues of 10YR or 7.5YR, values of 4 or 5, and chromas of 4 through 6. Some pedons have few to common gray mottles below the upper 10 inches of the profile horizon. Texture is silt loam or

residuum from limestone. Hagerstown soils are mostly in the western half of the county on smooth convex ridgetops and side slopes. Slope ranges from 2 to 12 percent but is dominantly 6 to 12 percent.

Hagerstown soils are associated with the Beasley, Caneyville, Crider, and Nicholson soils. Beasley soils are underlain by soft, calcareous siltstone, sandstone, shale, and limestone. Caneyville soils are moderately deep to bedrock. Crider soils have less clay in the upper part of the solum than Hagerstown soils. Nicholson soils have less clay in the upper part of the solum, are moderately well drained, and have a fragipan.

Typical pedon of Hagerstown silt loam in an area of Hagerstown silt loam, 6 to 12 percent slopes, 2 miles north of Brownsboro, 3/4 mile north of Halls Hill Road, and 1/4 mile west of Darby Creek:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many medium roots; slightly acid; abrupt smooth boundary.

## Huntington Series

The Huntington series consists of deep, well drained soils that have moderate permeability. They formed in mixed alluvium and are subject to brief flooding in winter and spring. Huntington soils are mostly on flood plains along the Ohio River. Slopes range from 0 to 2 percent.

Huntington soils are associated with the Elk, Lindside, Newark, Otwell, Weinbach, and Wheeling soils. All of the associated soils lack a mollic epipedon. The Elk soils formed in similar materials but are on stream terraces. The Lindside and Newark soils are in similar landscape positions but are wetter. The Otwell and Weinbach soils are on stream terraces, are wetter, and have a fragipan. The Wheeling soils are on stream terraces and are more sandy.

Typical pedon of Huntington silt loam in an area of Huntington silt loam, 1.4 miles northwest of the junction of U.S. Highway 42 and Kentucky Highway 393, 0.25 mile southwest of the confluence of Darby Hollow and the

Some pedons have a C horizon that has similar color ranges to those of the B2 horizon. Textures are commonly stratified with layers of loam, fine sandy loam, or gravelly sandy loam.

Laboratory data are available from a pedon within the same delineation as the typical pedon. These data indicate the weighted average clay content in the control section is 32.5 percent. This is slightly outside the range allowed for the series (upper limit of 30 percent), but it is within the normal error of estimate.

### Lawrence Series

The Lawrence series consists of deep, somewhat poorly

Some pedons have a 3 to 6 inch silt loam B1 horizon with hues of 2.5Y or 10YR, values of 5 or 6, and chroma of 3 through 6.

The B2t horizon has hues of 2.5Y or 10YR, values of 5 or 6, and chromas of 3 through 6. It has few to many mottles of chroma 2 or less. Texture is silt loam or silty clay loam.

The Bx horizon has hues of 5Y through 7.5YR, values of 5 through 7, and chromas of 1 through 8. Many pedons are equally mottled in shades of gray and brown. Texture is silt loam or silty clay loam. Structure is weak or moderate, very coarse, prismatic.

The B3 and C horizons have hues of 5Y through 5YR, values of 5 through 7, and chromas of 1 through 6. Some pedons are equally mottled

The C horizon has hues of 7.5YR through 2.5Y, values of 4 through 6, and chromas of 1 through 4. It is weakly stratified with silty clay loam, silt loam, loam, and fine sandy loam.

### Lowell Series

The Lowell series consists of deep, well drained soils that have moderately slow permeability. They formed in clayey residuum derived from limestone, siltstone, and shale. Lowell soils are on smooth convex ridgetops and side slopes mostly in the southeastern portion of the county. Slopes range from 2 to 12 percent but are dominantly 6 to 12 percent.

Lowell soils are associated with the Beasley, Cynthiana, Faywood, and Nicholson soils. Beasley soils are underlain by interbedded, soft limestone and calcareous siltstone, sandstone, and shale. Cynthiana and Faywood soils are shallower to hard bedrock and contain more rock fragments than Lowell soils. Nicholson soils are moderately well drained, contain less clay, and have a fragipan.

The B2t horizon has hues of 7.5YR through 2.5Y, values of 4 or 5, and chromas of 4 or 6. Some pedons have mottles with a chroma of 2 below the upper 10 inches of the argillic horizon. Texture is silty clay loam, silty clay, or clay.

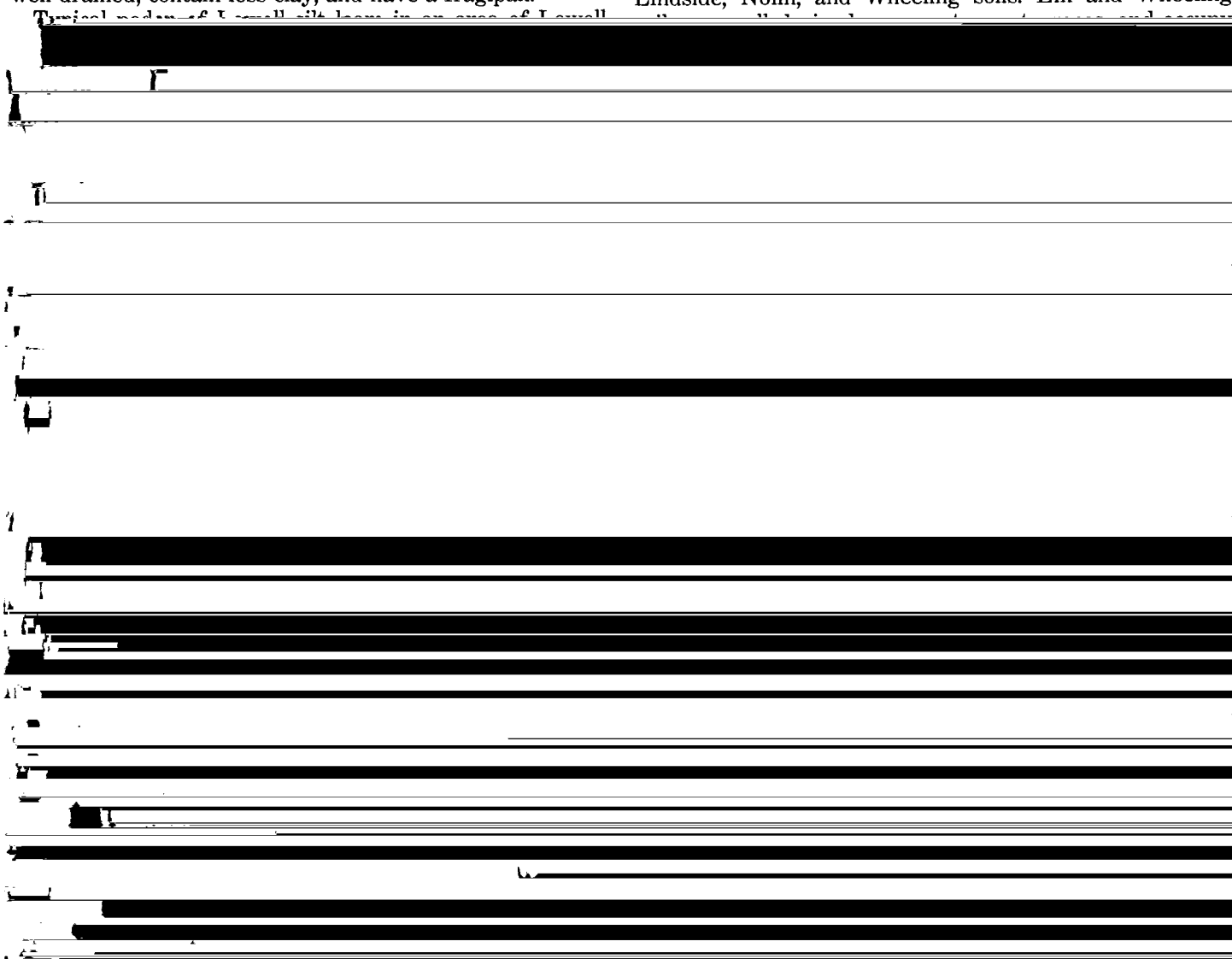
The B3 horizon has hues of 10YR through 5Y, values of 5, and chromas of 3 through 6. It is mottled in shades of brown, gray, yellow, and olive. Texture is silty clay or clay.

Some pedons have a C horizon with color and texture ranges similar to those of the B3 horizon.

### Newark Series

The Newark series consists of deep, somewhat poorly drained soils that have moderate permeability. They formed in mixed alluvium and are subject to brief flooding in winter and spring. Newark soils are on flood plains of major streams and their tributaries. They have a water table at depths of 1/2 to 1 1/2 feet in late winter and early spring. Slopes range from 0 to 2 percent.

Newark soils are associated with the Elk, Huntington, Lindside, Nolin, and Wheeling soils. Elk and Wheeling



silt loam, 6 to 12 percent slopes, 1.5 miles southeast of Ballardsville, 0.5 mile south of Kentucky Highway 92, and

higher landscape positions. Huntington and Nolin are well

Texture is dominantly silt loam or silty clay loam, but in places is . . . The B<sub>1</sub> horizon has hues of 7.5YR through 9.5Y, values of 2 through

stratified with thin layers of loam, fine sandy loam, or silty clay.

### Nicholson Series

The Nicholson series consists of deep, moderately well drained soils that have a slowly permeable fragipan. They formed in a loess mantle and the underlying clayey residuum derived from limestone, siltstone, and shale. Nicholson soils are on smooth convex ridgetops and side slopes throughout the county. They have a water table at depths of 1 1/2 to 2 1/2 feet in late winter and early spring. Slope ranges from 2 to 12 percent but is dominantly 6 to 12 percent.

Nicholson soils are associated with the Beasley, Crider, Lawrence, and Lowell soils. Beasley and Lowell soils are well drained and clayey. Crider soils are well drained and lack the fragipan. Lawrence soils are wetter.

Typical pedon of Nicholson silt loam in an area of Nicholson silt loam, 2 to 6 percent slopes, 3 miles south of Ballardsville, 0.5 mile southwest of Kentucky Highway 1315, 0.4 mile southeast of Floyds Fork, and 200 yards south of gravel road:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; neutral; clear smooth boundary.

B21t—7 to 15 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; many fine roots; common thin patchy clay films; medium acid; gradual smooth boundary.

B22t—15 to 27 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common thin patchy clay films; medium acid; clear wavy boundary.

5, chromas of 4 through 8, and few to many mottles with a chroma of 2 or less. Texture is silt loam or silty clay loam. Structure is weak or moderate very coarse prismatic.

The IIB horizon is mottled and has hues of 2.5YR through 2.5Y, values of 4 or 5, and chromas of 2 through 6. Texture is silty clay or clay.

The IIC horizon has similar color and texture ranges as the IIB horizon.

### Nolin Series

The Nolin series consists of deep, well drained soils that have moderate permeability. They formed in mixed alluvium and are subject to brief flooding in winter and spring. Nolin soils are on flood plains of major streams and their tributaries. Slope ranges from 0 to 2 percent.

Nolin soils are associated with the Boonesboro, Elk, Lindside, Newark, Otwell, and Weinbach soils. Boonesboro soils are moderately deep to bedrock and generally contain more coarse fragments. Elk, Otwell, and Weinbach soils are on stream terraces and occupy higher landscape positions. Lindside and Newark soils are wetter and contain low chroma mottles above 24 inch depths.

Typical pedon of Nolin silt loam in an area of Nolin silt loam, 1/2 mile east of Floydsburg, 230 yards northeast of Kentucky Highway 1408, and 75 feet west of Currys Fork:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine and medium roots; neutral; clear smooth boundary.

R21—8 to 24 inches; brown (10YR 4/3) silt loam; weak fine subangular

depths of 1 1/2 to 2 1/2 feet in late winter or early spring. Slope ranges from 2 to 6 percent.

Otwell soils are associated with the Elk, Huntington, Lindside, Newark, Nolin, Weinbach, and Wheeling soils. Elk soils are well drained, and Weinbach soils are somewhat poorly drained. Wheeling soils are well drained and contain more sand than Otwell soils. Huntington, Lindside, Newark, and Nolin soils are on flood plains and occupy lower positions on the landscape.

Typical pedon of Otwell silt loam in an area of Otwell silt loam, 2 to 6 percent slopes, 0.6 mile northeast of Floydsburg, 150 yards north of Currys Fork:

- Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine roots; neutral; clear smooth boundary.
- B1—7 to 11 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; common fine roots; thin patchy clay films; few dark brown concretions; neutral; clear wavy boundary.
- B21t—11 to 17 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; thin nearly continuous clay films; few small rounded black concretions; slightly acid; clear smooth boundary.
- B22t—17 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; common medium faint mottles of light yellowish brown (10YR 6/4) and dark yellowish brown (10YR 4/4); moderate medium subangular blocky structure; slightly firm; few fine roots; thin nearly continuous clay films; common dark brown and black stains; very strongly acid; clear wavy boundary.
- Bx—24 to 33 inches; mottled yellowish brown (10YR 5/4), brown (7.5YR 4/4), and light brownish gray (10YR 6/2) silty clay loam; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm, brittle and compact; continuous clay film on prism faces; few somewhat flattened pebbles 1/4 to 3/4 inch in diameter; few dark brown concretions; very strongly acid; clear wavy boundary.
- B31—33 to 42 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct mottles of light brownish gray (10YR 6/2) and dark yellowish brown (10YR 4/4); weak coarse subangular blocky structure; firm; common rounded pebbles 1/4 to 1 1/2 inches in diameter; many dark brown concretions; medium acid; gradual wavy boundary.
- B32—42 to 51 inches; grayish brown (2.5Y 5/2) silty clay; common medium distinct mottles of yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4); weak coarse subangular blocky structure; very firm; few small rounded pebbles 1/4 to 1 inch in diameter; common dark brown concretions; medium acid; clear wavy boundary.
- C—51 to 62 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium distinct mottles of yellowish brown (10YR 5/6) and brown (7.5YR 4/4); massive; very firm; few pebbles 1/4 to 3/4 inch in diameter; few dark brown concretions; neutral.

Solum thickness ranges from 40 to more than 80 inches. Depth to bedrock ranges from 4 to more than 10 feet, except along the Ohio River, where it ranges to more than 20 feet. Coarse fragments are absent in most pedons, but range from 0 to 5 percent in the solum and up to 20 percent in the C horizon. Reaction in the upper part of the solum ranges from neutral to very strongly acid, and the fragipan is very strongly acid. The lower part of the solum and C horizon range from

The Bx horizon has hues of 7.5YR through 2.5Y, values of 4 through 7, and chromas of 3 through 6. Texture is silt loam or silty clay loam. Structure is moderate to strong, very coarse, prismatic.

The B3 and C horizons have hues of 10YR or 2.5Y, values of 4 through 6, and chromas of 2 through 6. Textures are silt loam, silty clay loam, or silty clay, but stratified layers of loam or fine sandy loam are present in places.

## Weinbach Series

The Weinbach series consists of deep, somewhat poorly drained soils that have a slowly permeable fragipan. They formed in mixed alluvium, and a few low areas are subject to occasional flooding. Weinbach soils are on stream terraces along the Ohio River, Harrods Creek, Floyds Fork, and their tributaries. They have a water table at depths of 1 to 2 feet in late winter and early spring. Slope ranges from 0 to 4 percent.

Weinbach soils are associated with the Elk, Huntington, Lindside, Newark, Nolin, Otwell, and Wheeling soils. Elk and Wheeling soils are well drained and lack a fragipan. Huntington, Lindside, Newark, and Nolin soils are on flood plains and occupy positions on the lower part of the landscape. Otwell soils are moderately well drained.

Typical pedon of Weinbach silt loam in an area of Weinbach silt loam, 0.5 mile north of the junction of Rose Island Road and Belknap Beach Road and 135 yards west of Rose Island Road:

- Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; very friable; many medium roots; few fine flakes of mica; slightly acid; clear smooth boundary.
- B1—8 to 12 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct mottles of light brownish gray (10YR 6/2); weak moderate subangular blocky structure; friable; common medium roots; few fine flakes of mica; common dark brown and black concretions; medium acid; gradual wavy boundary.
- B2g—12 to 23 inches; light brownish gray (10YR 6/2) silty clay loam; many medium distinct mottles of dark yellowish brown (10YR 5/4); moderate medium subangular blocky structure; firm; few fine roots; few fine flakes of mica; common dark brown and black concretions; medium acid; abrupt wavy boundary.
- Bxg—23 to 39 inches; light brownish gray (10YR 6/2) silty clay loam; many medium distinct mottles of dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6); strong very coarse prismatic structure parting to moderate medium angular blocky; very firm, brittle and compact; few fine roots along prism faces; thin continuous clay films on prism faces; few fine flakes of mica; few dark brown and black concretions; very strongly acid; gradual smooth boundary.
- B3—39 to 49 inches; brown (10YR 4/3) silty clay loam; common medium distinct mottles of light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4); moderate coarse prismatic structure; firm; few thin clay films on prism faces; few fine flakes of mica; few dark brown and black concretions; very strongly acid; gradual wavy boundary.
- C—49 to 54 inches; dark yellowish brown (10YR 4/4) silty clay loam;

The Ap horizon has a hue of 10YR, values of 2 through 4, and chromas of 2 or 3. Texture is silt loam. Some pedons have a silt loam A2 horizon, 3 to 6 inches thick, with a hue of 10YR, values of 5 or 6, and chromas of 2 or 3.

The B1 horizon has a hue of 10YR, values of 5 or 6, chromas of 2 through 4, and common to many mottles with chroma of 1 through 4. Texture is silt loam or silty clay loam.

The B2g horizon has a hue of 10YR, values of 5 or 6, chromas of 2 or less, and common to many mottles with chromas of 3 or 4. Texture is silt loam or silty clay loam.

The Bx horizon has hues of 10YR or 2.5Y, values of 4 through 6, a chroma of 2 or less, and common to many mottles with chromas of 1

Solum thickness ranges from 40 to 60 inches, and depth to bedrock ranges from 5 to more than 20 feet. Coarse fragments in the upper 40 inches range from 0 to 15 percent. In the underlying material they range from 5 to more than 35 percent. Reaction of the solum ranges from medium to strongly acid unless the surface has been limed. In the C horizon it ranges from neutral to strongly acid. Fine flakes of mica are common throughout the profile.

The Ap horizon has a hue of 10YR, values of 4 or 5, and chromas of 2 or 3. Texture is silt loam, loam, or fine sandy loam.

The B2t horizon has hues of 10YR or 7.5YR, values of 4 or 5, and chromas of 3 through 6. Texture is loam, silt loam, or silty clay loam.

The B3 horizon has colors similar to those in the B2t horizon. Texture ranges from loam to sandy loam.

The B21t horizon has hues of 10YR or 7.5YR, values of 2 through 5, and chromas of 2 through 6. Some pedons have few to common mottles in shades of gray below the upper 10 inches of the argillic horizon. Texture is silty clay loam or silty clay.

The B22t and B3 horizons have hues of 7.5YR through 2.5Y, values of 4 or 5, and chromas of 3 through 6. Texture is silty clay loam, silty clay, or clay.

The C horizon has hues of 10YR or 2.5Y, values of 4 through 6, and chromas of 2 through 6. Some pedons are equally mottled in shades of brown and gray. Texture is silty clay or clay.

## Classification

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to the latest literature available (8, 12, 16).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred from other properties that are

one or more adjectives preceding the name of the great group. The adjective *Typic* identifies for the subgroup that is thought to typify the great group. An example is Typic Haplaquents.

**FAMILY.** Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, mixed, nonacid, mesic, Typic Haplaquents.

**SERIES.** The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these charac-

- (15) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962.]
- (16) United States Department of Agriculture. 1960. Soil classification, a comprehensive system, 7th approximation. Soil Conserv. Serv. 265 pp., illus. [Supplements issued March 1967, September 1968, April 1969.]
- (17) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Hand. 210, 21 pp.
- (18) United States Department of Agriculture. 1967. Soil survey laboratory data and descriptions for some soils of Kentucky. Soil Conserv. Serv. in coop. Ky. Agric. Exp. Stn., Soil Surv. Invest. Rep. 14, 137 pp.
- (19) United States Department of Agriculture. 1970. Kentucky soil and water conservation needs inventory. Lexington, Ky. Soil Conserv. Serv.

grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

**Consistence, soil.** The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

*Loose.*—Noncoherent when dry or moist; does not hold together in a mass.

*Friable.*—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

*Firm.*—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

*Plastic.*—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

*Sticky.*—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

## Glossary

**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

with difficulty between thumb and forefinger.

*Soft.*—When dry, breaks into powder or individual grains under very slight pressure.

*Cemented.*—Hard; little affected by moistening.

**Contour stripcropping (or contour farming).** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

monly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

*Poorly drained.*—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

*Very poorly drained.*—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Erosion.** The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion (geologic).* Erosion caused by geologic processes acting over

**Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

**Gravel.** Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

**Ground water (geology).** Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

**Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Gypsum.** Hydrous calcium sulphate.

**Habitat.** The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

*O horizon.* An organic layer, fresh and decaying plant residue, at

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Karst (topography).** The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

**Landslide.** The rapid downhill movement of a mass of soil and loose rock generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones.** Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

**Light textured soil.** Sand and loamy sand.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.

**Low strength.** Inadequate strength for supporting loads.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

**Miscellaneous areas.** Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

**Moderately coarse textured (moderately light textured) soil.** Sandy loam and fine sandy loam.

**Moderately fine textured (moderately heavy textured) soil.** Clay loam, sandy clay loam, and silty clay loam.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Percs slowly.** The slow movement of water through the soil adversely affecting the specified use.

**Permeability.** The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

**pH value.** (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

**Piping.** Moving water of subsurface tunnels or pipelike cavities in the soil.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from a semisolid to a plastic state.

**Poorly graded.** Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Productivity (soil).** The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Reaction, soil.** The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid .....	Below 4.5
Very strongly acid .....	4.5 to 5.0
Strongly acid .....	5.1 to 5.5
Medium acid .....	5.6 to 6.0
Slightly acid .....	6.1 to 6.5
Neutral .....	6.6 to 7.3
Mildly alkaline .....	7.4 to 7.8
Moderately alkaline .....	7.9 to 8.4
Strongly alkaline .....	8.5 to 9.0
Very strongly alkaline .....	9.1 and higher

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by weathering and other soil-forming processes.

**Seepage.** The rapid movement of water through the soil. Seepage adversely affects the specified use.

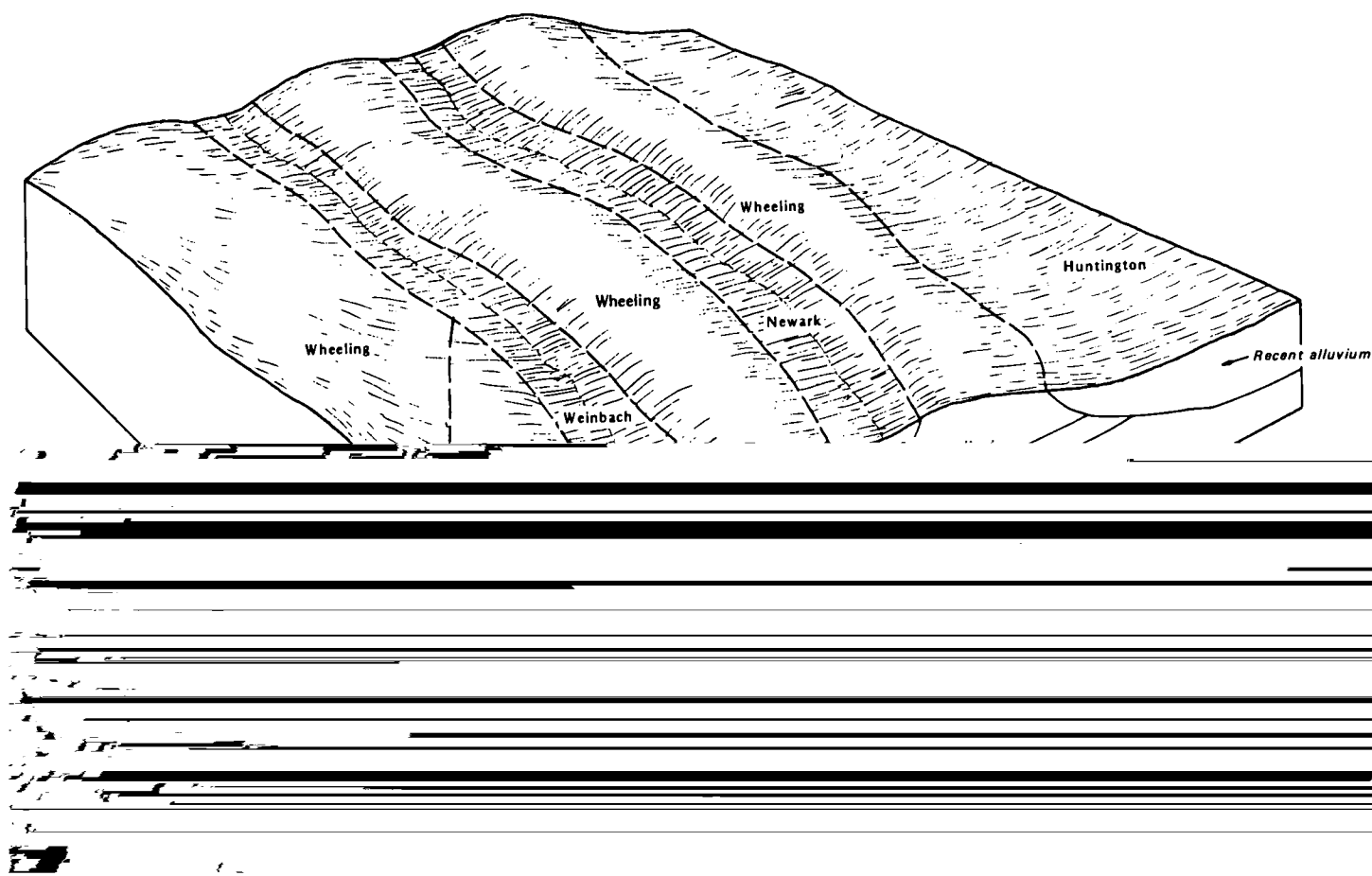
**Series, soil.** A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or

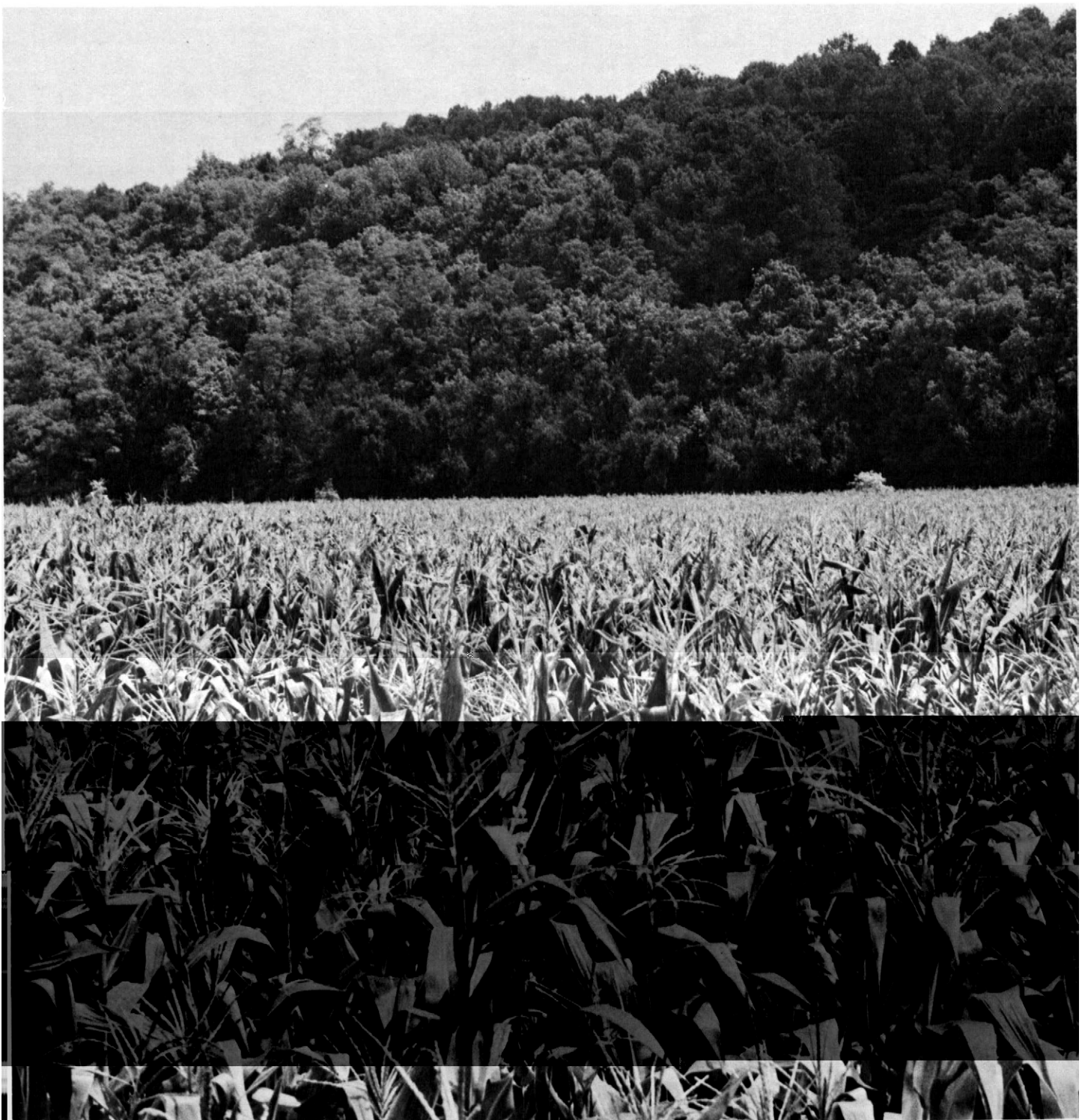
**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Substratum.** The part of the soil below the solum.



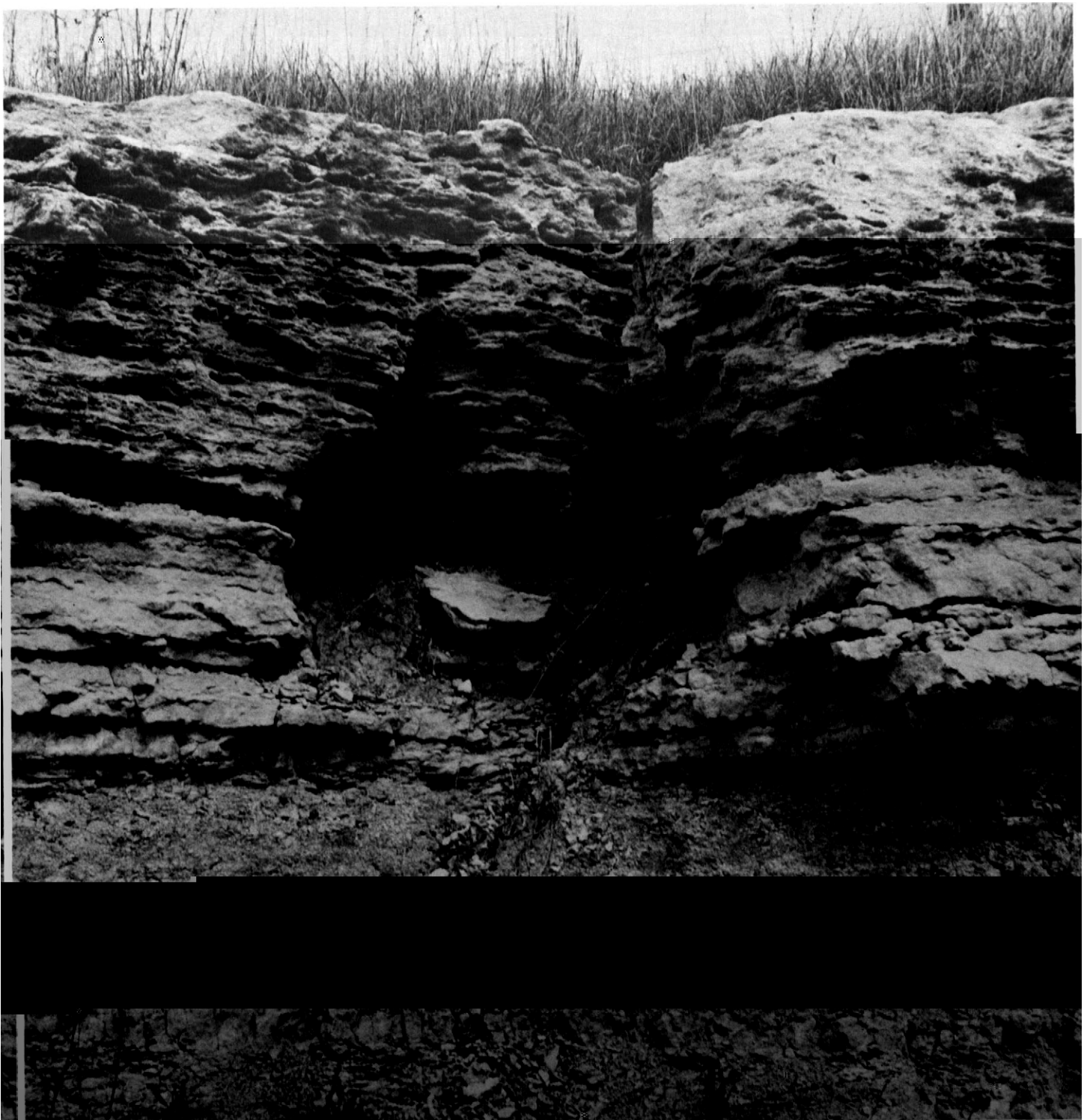
## **Illustrations**



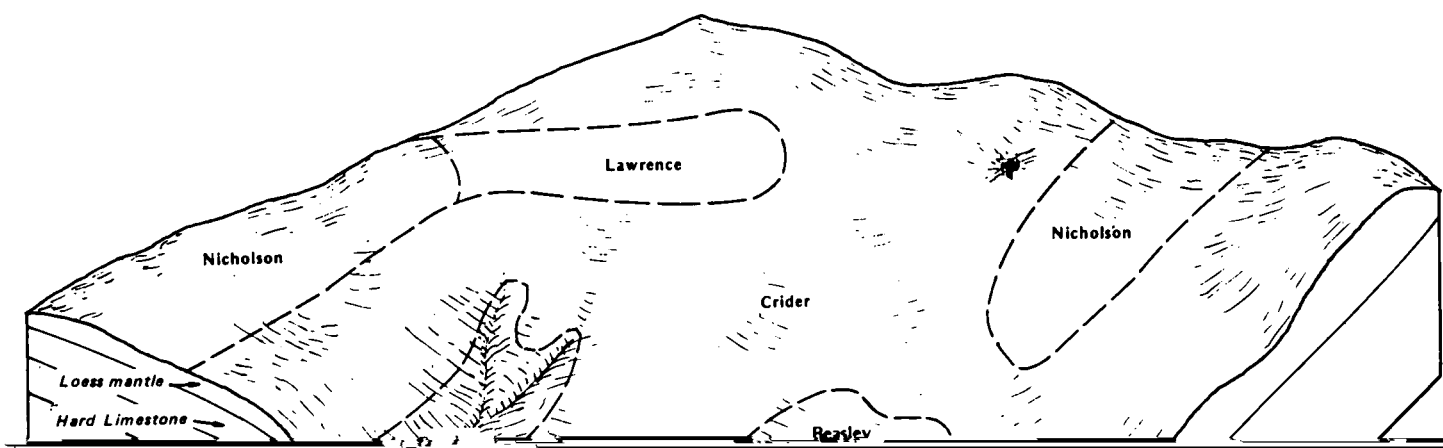


*Figure 2.*—Corn on Wheeling-Huntington association and woodland in background on Beasley-Caneyville association.





*Figure 4.*—Sinkhole in the limestone parent material of the Crider-Nicholson association.



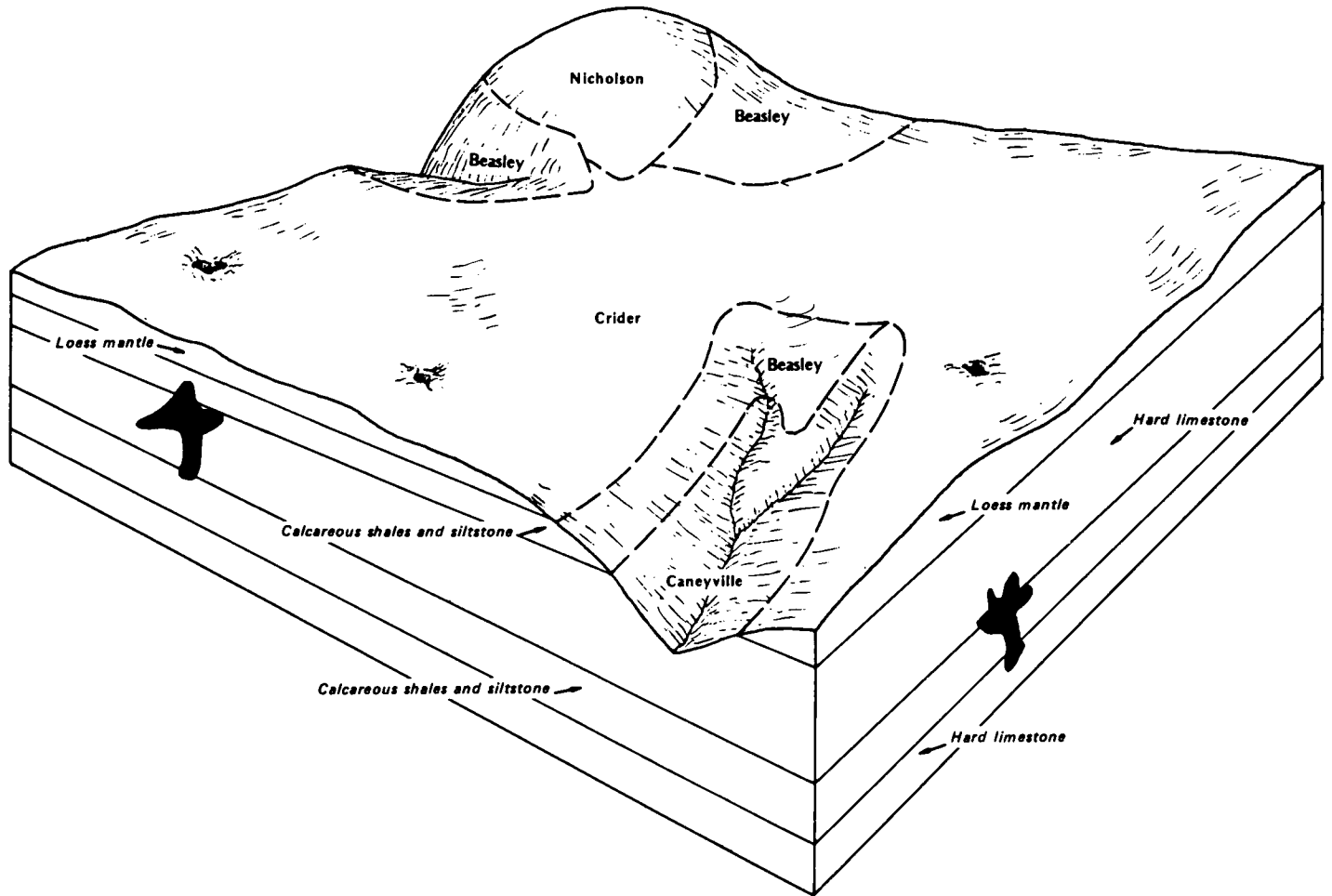
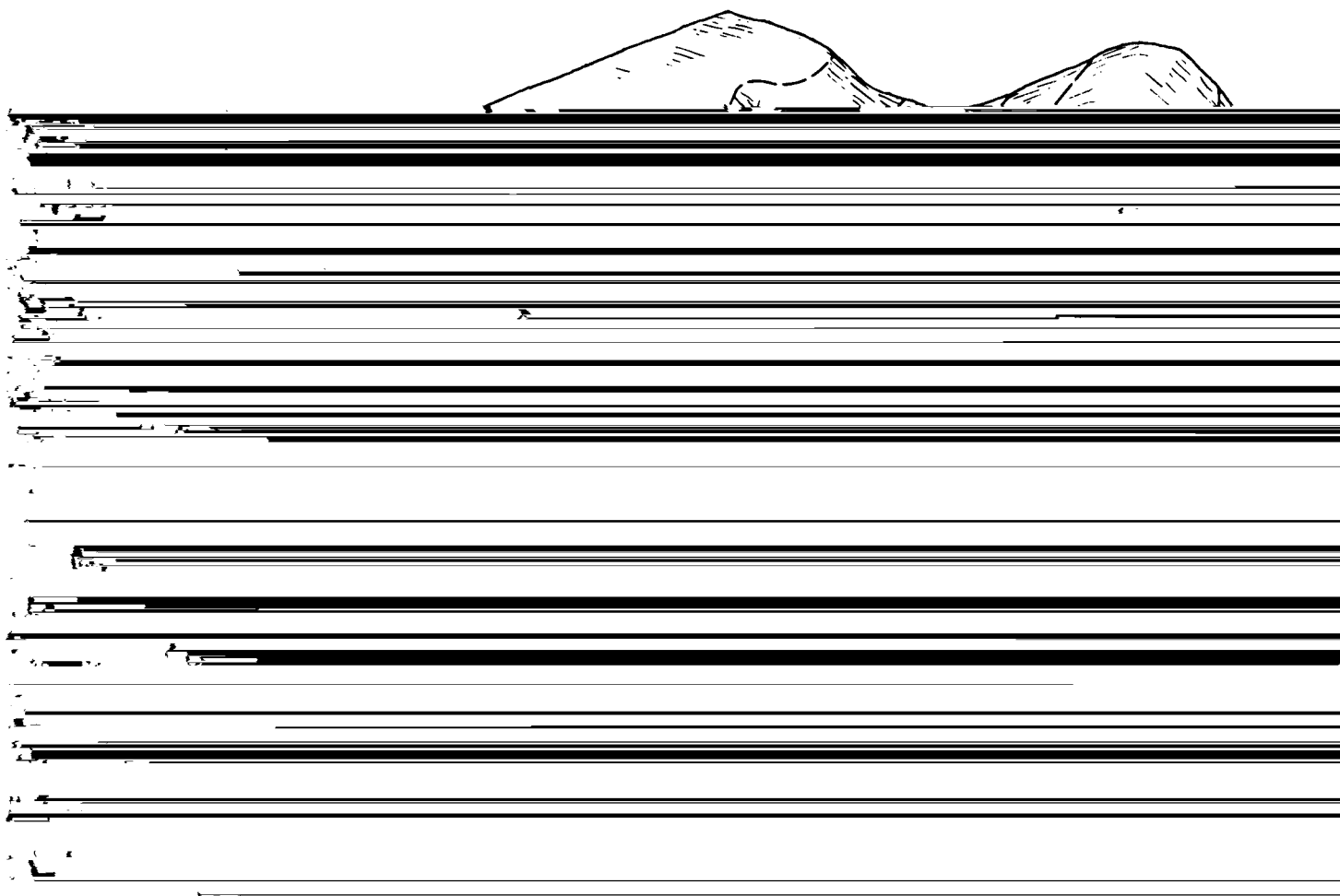


Figure 6.—Pattern of soils and underlying material in Crider-Beasley association.





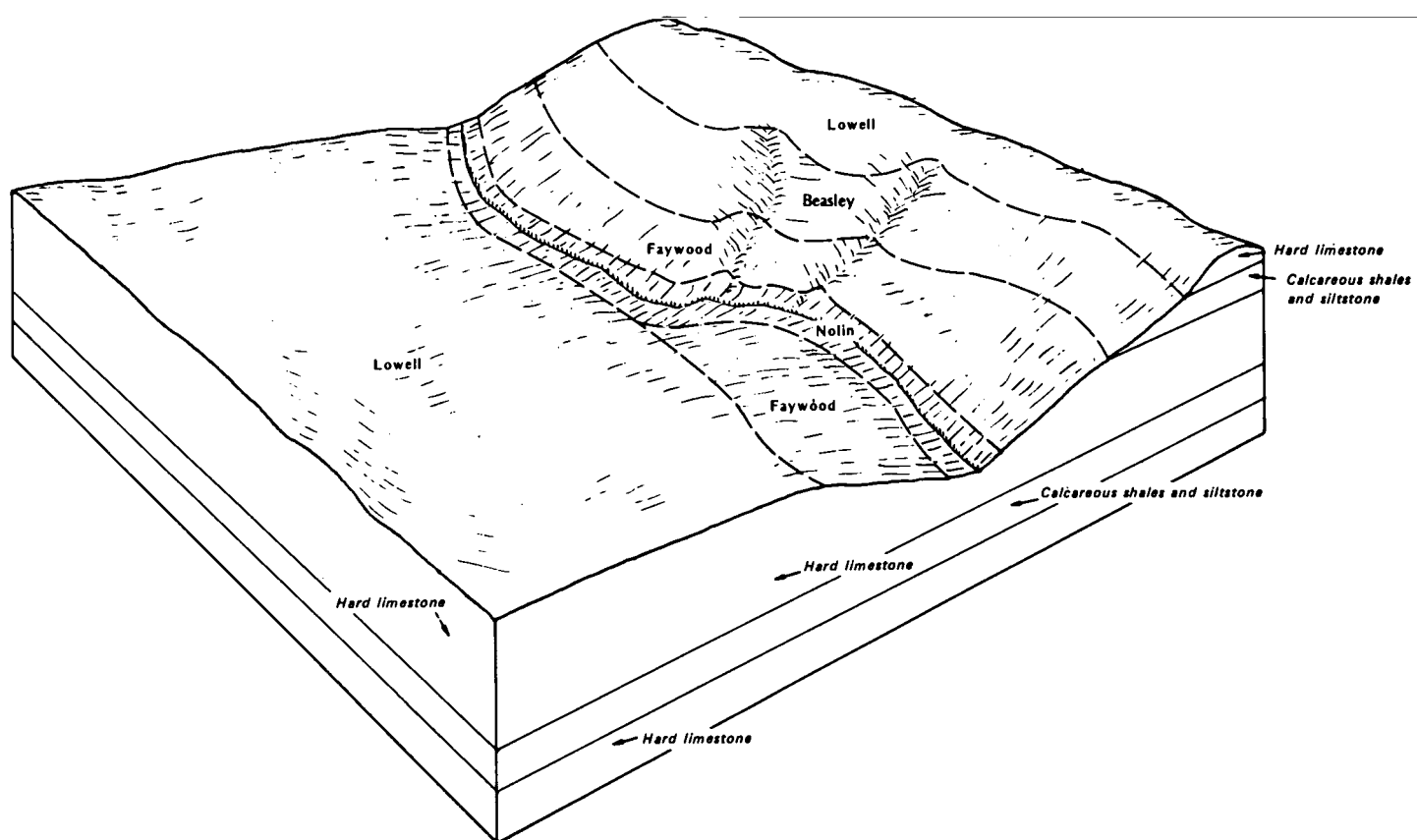
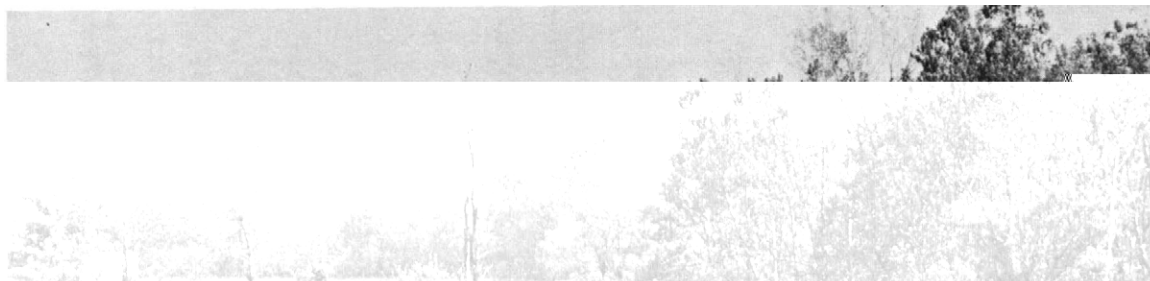


Figure 9.—Pattern of soils and underlying material in Lowell-Faywood-Beasley association.



*Figure 10.*—Beef cattle on Lindside silt loam. Woodland is in area of Beasley silt loam, 12 to 20 percent slopes.



*Figure 11.*—Burley tobacco on Lowell silt loam, 2 to 6 percent slopes, and pasture on Lowell silt loam, 6 to 12 percent slopes.



*Figure 12.*—Urban development crowding out cropland and pasture on Crider silt loam, 2 to 6 percent slopes.  
(Courtesy of Billy Davis, The Courier-Journal and Louisville Times)

## Tables

## SOIL SURVEY

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature <sup>1</sup>						Precipitation <sup>1</sup>				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days <sup>2</sup>	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
	F	F	F	F	F	Units	In	In	In		In
January----	41.9	25.0	33.5	69	-5	6	3.28	1.89	4.41	6	5.2
February----	45.5	27.2	36.4	70	0	11	3.40	1.64	4.83	6	4.6
March-----	54.5	35.0	44.8	82	15	72	4.73	2.35	6.66	8	4.2
April-----	67.7	45.8	56.8	87	27	228	4.14	2.10	5.80	8	.2
May-----	76.4	54.3	65.4	92	35	477	4.19	2.72	5.52	8	.0
June-----	84.4	63.1	73.8	97	47	714	3.46	1.68	4.91	6	.0
July-----	87.9	67.2	77.5	98	52	853	4.02	2.19	5.51	7	.0
August-----	86.9	65.5	76.2	98	52	812	3.11	1.24	4.61	5	.0
September--	80.8	58.6	69.7	96	40	591	3.18	1.53	4.52	5	.0
October----	69.6	46.3	58.0	89	27	266	2.33	1.28	3.18	5	.0
November---	55.1	36.2	45.7	80	16	23	3.36	1.86	4.58	6	1.5
December---	45.2	29.0	37.1	71	3	22	3.41	2.04	4.63	7	2.4
Year-----	66.3	46.1	56.2	100	-7	4,075	42.61	37.36	47.69	77	18.1

<sup>1</sup>Recorded in the period 1951-74 at Louisville, Ky.

<sup>2</sup>A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature <sup>1</sup>		
	24 F or lower	28 F or lower	32 F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 2	April 7	April 26
2 years in 10 later than--	March 28	April 3	April 21
5 years in 10 later than--	March 16	March 27	April 11
First freezing temperature in fall:			
1 year in 10 earlier than--	November 1	October 19	October 13
2 years in 10 earlier than--	November 5	October 24	October 17
5 years in 10 earlier than--	November 13	November 2	October 26

<sup>1</sup>Recorded in the period 1951-74 at Louisville, Ky.

TABLE 3.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season <sup>1</sup>		
	Higher than 24 F Days	Higher than 28 F Days	Higher than 32 F Days
9 years in 10	221	198	176
8 years in 10	228	206	183
5 years in 10	241	220	197
2 years in 10	254	234	211
1 year in 10	261	241	218

<sup>1</sup>Recorded in the period 1951-74

## SOIL SURVEY

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
BeB	Beasley silt loam, 2 to 6 percent slopes-----	2,280	1.9
BeC	Beasley silt loam, 6 to 12 percent slopes-----	17,000	14.4

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1975. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Corn	Soybeans	Tobacco	Grass- legume hay	Pasture
	<u>Bu</u>	<u>Bu</u>	<u>Lb</u>	<u>Tons</u>	<u>AUM<sup>1</sup></u>
Beasley:					
BeB-----	100	30	2,600	3.0	8.0
BeC-----	90	25	2,300	2.5	7.0
BeD-----	75	---	2,000	2.0	6.0
BfC3-----	70	---	---	2.0	5.0
BfD3-----	---	---	---	1.5	4.0
2RnF-----	---	---	---		

## SOIL SURVEY

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Tobacco	Grass- legume hay	Pasture
	<u>Bu</u>	<u>Bu</u>	<u>Lb</u>	<u>Tons</u>	<u>AUM<sup>1</sup></u>
Newark: Ne-----	110	40	2,500	3.5	8.5
Nicholson: NhB-----	90	40	2,600	3.5	8.5
NhC-----	85	35	2,400	3.5	8.0
Nolin: No-----	135	45	3,200	4.5	9.5
Otwell: OtB-----	95	40	2,600	3.5	8.5
Pits: Pt-----	---	---	---	---	---
Weinbach: We-----	90	35	---	3.5	6.5
Wheeling: WhA-----	125	40	3,000	4.0	9.5
WhB-----	125	40	3,000	4.0	9.0
WhC-----	115	35	2,800	3.5	8.5
WLD-----	90	---	---	3.0	7.5
Woolper: WoB-----	115	40	2,900	3.0	8.0
WoC-----	100	25	2,600	3.0	8.0

<sup>1</sup>Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.

<sup>2</sup>This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas excluded. Absence of an entry means no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
I	6,050	---	---	---
II	39,460	37,930	680	850
III	35,940	34,350	1,590	---
IV	8,490	8,490	---	---
V	---	---	---	---
VI	14,750	9,710	---	5,040
VII	12,380	7,330	---	5,050
VIII	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Important trees	Site index	
Beasley: BeB, BeC-----	3c	Moderate	Moderate	Slight	Moderate	Northern red oak---- Eastern white pine-- Virginia pine----- Eastern redcedar----	63 69 70 38	Shortleaf pine, loblolly pine, eastern white pine, black locust, white ash, eastern redcedar.
BeD-----	3c	Severe	Severe	Slight	Moderate	Northern red oak---- Eastern white pine-- Virginia pine----- Eastern redcedar----	63 69 70 38	Shortleaf pine, loblolly pine, eastern white pine, black locust, white ash, eastern redcedar.
BfC3, BfD3-----	4c	Severe	Severe	Slight	Slight	Northern red oak---- Virginia pine----- Eastern redcedar----	60 60 40	Shortleaf pine, loblolly pine, black locust, eastern redcedar.
<sup>1</sup> BnF: Beasley part----	3c	Severe	Severe	Slight	Moderate	Northern red oak---- Eastern white pine-- Virginia pine----- Eastern redcedar----	63 69 70 38	Shortleaf pine, loblolly pine, eastern white pine, black locust, white ash, eastern redcedar.
Caneyville part-	3c	Severe	Severe	Slight	Moderate	Northern red oak---- Yellow-poplar----- Eastern redcedar----	69 80 45	Eastern redcedar, Virginia pine.
Boonesboro: Bo-----	1o	Slight	Slight	Slight	Severe	Northern red oak----	85	Black walnut, eastern cottonwood, sweetgum, yellow-poplar, white ash, eastern white pine, shortleaf pine.
Brassfield: <sup>1</sup> BsE: Brassfield part-	4d	Severe	Moderate	Slight	Slight	Scarlet oak----- Eastern redcedar----	45 40	Eastern redcedar, Virginia pine, Scotch pine.
Beasley part----	3c	Severe	Severe	Slight	Moderate	Northern red oak---- Eastern white pine-- Virginia pine----- Eastern redcedar----	63 69 70 38	Shortleaf pine, loblolly pine, eastern white pine, black locust, white ash, eastern redcedar.
Caneyville: CaC-----	3c	Moderate	Moderate	Slight	Moderate	Northern red oak---- Eastern white pine-- Yellow-poplar----- Eastern redcedar----	69 80 45	Eastern redcedar, Virginia pine.
<sup>1</sup> CbD: Caneyville part--	3c	Severe	Severe	Slight	Moderate	Northern red oak---- Yellow-poplar----- Eastern redcedar----	69 80 45	Eastern redcedar, Virginia pine.

See footnote at end of table.

## SOIL SURVEY

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

[illegible]

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Important trees	Site index	
Lindside: Ln-----	1o	Slight	Slight	Slight	Severe	Northern red oak---- Yellow-poplar-----	85 95	Eastern white pine, yellow-poplar, white ash, black walnut.
Lowell: LoB, LoC, LsC3----	2c	Slight	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar----- Shortleaf pine----- Virginia pine-----	70 90 80 80	Yellow-poplar, eastern white pine, shortleaf pine, black walnut, loblolly pine.
Newark: Ne-----	1w	Slight	Moderate	Slight	Severe	Pin oak----- Eastern cottonwood-- Northern red oak---- Yellow-poplar----- Sweetgum-----	99 94 85 95 88	Eastern cottonwood, sweetgum, American sycamore, loblolly pine, eastern white pine, yellow-poplar.
Nicholson: NhB, NhC-----	2o	Slight	Slight	Slight	Severe	Northern red oak----	80	Black walnut, yellow-poplar, eastern white pine, shortleaf pine, white ash.
Nolin: No-----	1o	Slight	Slight	Slight	Severe	Sweetgum----- Yellow-poplar-----	85 107	Sweetgum, yellow-poplar, eastern white pine, eastern cottonwood, white ash, cherrybark oak.
Otwell: OtB-----	3o	Slight	Slight	Slight	Moderate	White oak----- Yellow-poplar----- Sugar maple-----	70 80 70	Eastern white pine, yellow-poplar, white ash.
Weinbach: We-----	2w	Slight	Moderate	Slight	Severe	White oak----- Pin oak----- Yellow-poplar----- Sweetgum-----	75 85 85 88	Eastern white pine, baldcypress, white ash, American sycamore, yellow-poplar.
Wheeling: WhA, WhB, WhC----	2o	Slight	Slight	Slight	Severe	Northern red oak---- Yellow-poplar-----	80 90	Eastern white pine, yellow-poplar, black walnut.
WLD-----	2r	Moderate	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar-----	80 90	Eastern white pine, yellow-poplar, black walnut.
Woolper: WoB, WoC-----	2c	Slight	Moderate	Slight	Severe	Northern red oak---- Yellow-poplar----- Shortleaf pine-----	80 90 80	Black walnut, yellow-poplar, eastern white pine.

<sup>1</sup>This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

## SOIL SURVEY

TABLE 8.--BUILDING SITE DEVELOPMENT

["Depth to rock" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Beasley: BeB-----	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: slope, low strength.	Moderate: low strength.
BeC, BfC3-----	Moderate: too clayey, slope.	Moderate: slope, low strength.	Moderate: slope, low strength.	Severe: slope.	Moderate: slope, low strength.
BeD, BfD3-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
<sup>1</sup> BnF: Beasley part---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Caneyville part	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Boonesboro: Bo-----	Severe: floods, depth to rock.	Severe: floods.	Severe: floods, depth to rock.	Severe: floods.	Severe: floods.
Brassfield: <sup>1</sup> BsE: Brassfield part	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Beasley part---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Caneyville: CaC-----	Severe: depth to rock.	Moderate: low strength, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: low strength, slope, depth to rock.
<sup>1</sup> CbD: Caneyville part	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Beasley part---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Crider: CrA-----	Slight-----	Slight-----	Slight-----	Slight-----	Slight.
CrB-----	Slight-----	Slight-----	Slight-----	Moderate: slope.	Slight.
CrC-----	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Cynthiana: <sup>1</sup> CyF: Cynthiana part-	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Cynthiana: CyF:					
Faywood part---	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Beasley part---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Elk: ElB-----	Slight-----	Slight-----	Slight-----	Moderate: slope.	Slight.
Faywood: FaC-----	Severe: depth to rock.	Moderate: slope, depth to rock, low strength.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock, low strength.
FaD, FsD3-----	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Hagerstown: HaB-----	Moderate: depth to rock, too clayey.	Moderate: low strength.	Moderate: depth to rock, low strength.	Moderate: slope, low strength.	Moderate: low strength.
HaC, HsC3-----	Moderate: slope, depth to rock, too clayey.	Moderate: slope, low strength.	Moderate: slope, depth to rock, low strength.	Severe: slope.	Moderate: low strength, slope.
Huntington: Hu-----	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Lawrence: La-----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.
Lindside: Ln-----	Severe: floods.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.
Lowell: LoB-----	Moderate: too clayey, depth to rock.	Moderate: low strength.	Moderate: low strength, depth to rock.	Moderate: slope, low strength.	Moderate: low strength.
LoC, LsC3-----	Moderate: slope, too clayey, depth to rock.	Moderate: slope, low strength.	Moderate: slope, low strength, depth to rock.	Severe: slope.	Moderate: slope, low strength.
Newark: Ne-----	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.
Nicholson: NhB-----	Moderate: wetness.	Moderate: wetness, low strength.	Severe: wetness.	Moderate: slope, wetness, low strength.	Moderate: low strength.

See footnote at end of table.



TABLE 9.--SANITARY FACILITIES

["Depth to rock" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Beasley: BeB-----	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----	Poor: too clayey.
BeC, BfC3-----	Severe: percs slowly.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Poor: too clayey.
BeD, BfD3-----	Severe: slope, percs slowly.	Severe: slope.	Moderate: too clayey.	Severe: slope.	Poor: slope, too clayey.
<sup>1</sup> BnF: Beasley part----	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, too clayey.
Caneyville part--	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, too clayey.
Boonesboro: Bo-----	Severe: floods, depth to rock.	Severe: floods, depth to rock.	Severe: floods, depth to rock.	Severe: floods, seepage.	Fair: thin layer.
Brassfield: <sup>1</sup> BsE: Brassfield part--	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope.
Beasley part----	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, too clayey.
Caneyville: CaC-----	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: too clayey.
<sup>1</sup> CbD: Caneyville part--	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, too clayey.
Beasley part----	Severe: slope, percs slowly.	Severe: slope.	Moderate: too clayey, slope.	Severe: slope.	Poor: slope, too clayey.
Crider: CrA, CrB-----	Slight-----	Moderate: seepage.	Slight-----	Slight-----	Good.
CrC-----	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.	Fair: slope.
Cynthiana: <sup>1</sup> CyF: Cynthiana part--	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, thin layer, too clayey.

See footnote at end of table.

## SOIL SURVEY

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Cynthiana: Faywood part-----	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Poor: slope, too clayey.
Beasley part-----	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope, too clayey.
Elk: ElB-----	Slight-----	Moderate: slope, seepage.	Slight-----	Slight-----	Good.
Faywood: FaC-----	Severe: depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: too clayey.
FaD, FsD3-----	Severe: slope, depth to rock, percs slowly.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, too clayey.
Hagerstown: HaB-----	Moderate: depth to rock.	Moderate: slope, seepage.	Severe: depth to rock.	Slight-----	Fair: too clayey.
HaC, HsC3-----	Moderate: slope, depth to rock.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Fair: too clayey, slope.
Huntington: Hu-----	Severe: floods.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Good.
Lawrence: La-----	Severe: percs slowly, wetness.	Slight-----	Severe: wetness.	Severe: wetness.	Good.
Lindside: Ln-----	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
Lowell: LoB-----	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock.	Slight-----	Poor: too clayey.
LoC, LsC3-----	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: slope.	Poor: too clayey.
Newark: Ne-----	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
Nicholson: NhB-----	Severe: percs slowly, wetness.	Moderate: slope.	Severe: depth to rock, wetness.	Moderate: wetness.	Good.
NhC-----	Severe: percs slowly, wetness.	Severe: slope.	Severe: depth to rock, wetness.	Moderate: wetness, slope.	Fair: slope.

See footnote at end of table.

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[illegible]

Nolin:

## SOIL SURVEY

TABLE 10.--CONSTRUCTION MATERIALS

["Low strength" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Beasley: BeB, BeC, BfC3-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
BeD, BfD3-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
<sup>1</sup> BnF: Beasley part-----	Poor: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Caneyville part----	Poor: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Boonesboro: Bo-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Brassfield: <sup>1</sup> BsE: Brassfield part----	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Beasley part-----	Poor: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Caneyville: CaC-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
<sup>1</sup> CbD: Caneyville part----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Beasley part-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
CrA, CrB-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
CrC-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Cynthiana: <sup>1</sup> CyF: Cynthiana part----	Poor: slope, low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, thin layer, too clayey.

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Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Cynthiana: Beasley part-----	Poor: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Elk: ElB-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Faywood: FaC-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
FaD, FsD3-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, too clayey.
Hagerstown: HaB-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
HaC, HsC3-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Huntington: Hu-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Lawrence: La-----	Fair: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Lindside: Ln-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Lowell: LoB, LoC, LsC3-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.
Newark: Ne-----	Fair: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Nicholson: NhB-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
NhC-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Nolin:				
Otwell: OtB-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.

## SOIL SURVEY

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Wheeling: WhA, WhB-----	Fair: low strength.	Fair: excess fines.	Fair: excess fines.	Good.
WhC-----	Fair: low strength.	Fair: excess fines.	Fair: excess fines.	Fair: slope.
W1D-----	Fair: slope, low strength.	Fair: excess fines.	Fair: excess fines.	Poor: slope.
Woolper: WoB, WoC-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey.

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TABLE 11.--WATER MANAGEMENT

["Seepage," and some of the other terms that describe restrictive soil features are defined in the Glossary.  
Absence of an entry means soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
Beasley: BeB, BeC, BeD, BfC3, BfD3-----	Slope-----	Low strength, compressible.	Not needed-----	Slope-----	Erodes easily, slope.
<sup>1</sup> BnF: Beasley part---	Slope-----	Low strength, compressible.	Not needed-----	Slope: erodes easily.	Erodes easily, slope.
Caneyville part	Depth to rock, slope.	Low strength, thin layer, compressible.	Not needed-----	Depth to rock, slope.	Slope, erodes easily, rooting depth.
Boonesboro: Bo-----	Seepage, depth to rock.	Seepage, thin layer.	Not needed-----	Depth to rock----	Rooting depth.
Brassfield: <sup>1</sup> BsE: Brassfield part	Seepage, slope.	Low strength, piping, hard to pack.	Not needed-----	Erodes easily, slope, depth to rock.	Slope, erodes easily.
Beasley part---	Slope-----	Low strength, compressible.	Not needed-----	Slope, erodes easily.	Erodes easily, slope.
Caneyville: CaC-----	Depth to rock, slope.	Low strength, thin layer, compressible.	Not needed-----	Depth to rock, slope, erodes easily.	Slope, erodes easily, rooting depth.
<sup>1</sup> CbD: Caneyville part	Depth to rock, slope.	Low strength, thin layer, compressible.	Not needed-----	Depth to rock, slope, erodes easily.	Slope, erodes easily, rooting depth.
Beasley part---	Slope-----	Low strength, compressible.	Not needed-----	Slope, erodes easily.	Erodes easily, slope.
Crider: CrA, CrB, CrC----	Slope, seepage.	Low strength, compressible, hard to pack.	Not needed-----	Slope-----	Erodes easily, slope.
Cynthiana: <sup>1</sup> CyF: Cynthiana part-	Depth to rock, slope.	Thin layer, compressible, low strength.	Not needed-----	Depth to rock, slope.	Slope, rooting depth.
Faywood part---	Depth to rock, slope.	Low strength, thin layer, compressible.	Not needed-----	Depth to rock, slope.	Slope, erodes easily, rooting depth.
Beasley part---	Slope-----	Low strength, compressible.	Not needed-----	Slope: erodes easily.	Erodes easily, slope.
Elk: ElB-----	Slope, seepage.	Low strength, piping.	Not needed-----	Slope, erodes easily.	Slope, erodes easily.
Faywood: FaC, FaD, FsD3----	Depth to rock, slope.	Low strength, thin layer, compressible.	Not needed-----	Depth to rock, slope.	Slope, erodes easily, rooting depth.

See footnote at end of table.

## SOIL SURVEY

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir	Embankments, dikes, and levees	Drainage	Terraces and divisions	Grassed waterways
Hagerstown: HaB, HaC, HsC3---	Seepage-----	Compressible, low strength.	Not needed-----	Favorable-----	Favorable.
Huntington: Hu-----	Slope, seepage.	Low strength, compressible, piping.	Not needed-----	Not needed-----	Not needed.
Lawrence: La-----	Favorable-----	Low strength, compressible, piping.	Percs slowly, wetness.	Not needed-----	Percs slowly, wetness, rooting depth.
Lindside: Ln-----	Seepage-----	Piping, low strength, compressible.	Floods-----	Not needed-----	Not needed.
Lowell: LoB, LoC, LsC3---	Slope-----	Low strength, compressible.	Not needed-----	Slope-----	Erodes easily, slope.
Newark: Ne-----	Seepage-----	Low strength, piping, compressible.	Wetness, floods, poor outlets.	Not needed-----	Wetness.
Nicholson: NhB, NhC-----	Depth to rock, slope.	Compressible, low strength.	Percs slowly, wetness, slope.	Percs slowly, wetness, erodes easily.	Percs slowly, erodes easily.
Nolin: No-----	Seepage-----	Piping, low strength.	Not needed-----	Not needed-----	Not needed.
Otwell: OtB-----	Favorable-----	Low strength, compressible.	Percs slowly, wetness.	Not needed-----	Erodes easily, percs slowly.
Pits: Pt.					
Weinbach: We-----	Favorable-----	Low strength, compressible, piping.	Percs slowly, wetness.	Not needed-----	Not needed.
Wheeling: WhA, WhB, WhC, WlD-----	Seepage, slope.	Seepage, piping, low strength.	Not needed-----	Slope, piping.	Slope, erodes easily.
Woolper: WoB, WoC-----	Slope-----	Low strength, compressible	Not needed-----	Slope-----	Erodes easily, slope.

TABLE 12.--RECREATIONAL DEVELOPMENT

["Percs slowly" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Beasley:				
BeB-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly.	Slight.
BeC-----	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
BeD-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
BfC3-----	Moderate: slope, percs slowly, too clayey.	Moderate: too clayey, slope.	Severe: slope.	Moderate: too clayey.
BfD3-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey.
<sup>1</sup> BnF:				
Beasley part-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Caneyville part----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Boonesboro:				
Bo-----	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Brassfield:				
<sup>1</sup> BsE:				
Brassfield part----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Beasley part-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Caneyville:				
CaC-----	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
<sup>1</sup> CbD:				
Caneyville part----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Beasley part-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Crider:				
CrA-----	Slight-----	Slight-----	Slight-----	Slight.
CrB-----	Slight-----	Slight-----	Moderate: slope.	Slight.
CrC-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Cynthiana:				
<sup>1</sup> CyF:				
Cynthiana part----	Severe: slope, large stones.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.

See footnote at end of table.

## SOIL SURVEY

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Cynthiana: Faywood part-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Beasley part-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Elk: ElB-----	Slight-----	Slight-----	Moderate: slope.	Slight.
Faywood: FaC-----	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
FaD, FsD3-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Hagerstown: HaB-----	Slight-----	Slight-----	Moderate: slope.	Slight.
HaC-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
HsC3-----	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
Huntington: Hu-----	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Lawrence: La-----	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.
Lindside: Ln-----	Severe: slope.	Moderate: slope.	Moderate: slope.	Slight.

		wetness.	wetness.	
Lowell: LoB-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly, slope.	Slight.
LoC-----	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight.
LsC3-----	Moderate: percs slowly, slope, too clayey.	Moderate: too clayey.	Severe: slope.	Moderate: too clayey.
Newark: Ne-----	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: floods, wetness.	Moderate: wetness.
Nicholson: NhB-----	Moderate: slope.	Slight-----	Moderate: slope.	Slight.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Nolin: No-----	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Otwell: Ot-----	Moderate: floods.	Moderate: floods.	Moderate: floods.	Slight.
Pits: Pt.				
Weinbach: We-----	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.

## SOIL SURVEY

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life
Beasley:										
BeB-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BeC, BfC3-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BeD, BfD3-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
<sup>1</sup> BnF:										
Beasley part----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Caneyville part----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Boonesboro:										
Bo-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Brassfield:										
<sup>1</sup> BsE:										
Brassfield part----	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Beasley part----	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Caneyville:										
CaC-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
<sup>1</sup> CbD:										
Caneyville part----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Beasley part----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Crider:										
CrA-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrB-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrC-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cynthiana:										
<sup>1</sup> CyF:										
Cynthiana part----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Faywood part----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Beasley part----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Elk:										
ElB-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnotes at end of table

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TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
Faywood:										
FaC-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FaD, FsD3-----	Poor	Poor	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hagerstown:										
HaB-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Huntington:										
Hu-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Lawrence:										
La-----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Lindside:										
Ln-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Lowell:										
LoB-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LoC, LsC3-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Newark:										
Ne-----	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.

## SOIL SURVEY

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
Woolper: WoB-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WoC-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

<sup>1</sup>This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

1. [REDACTED]

2. [REDACTED]

3. [REDACTED]

4. [REDACTED]

5. [REDACTED]

6. [REDACTED]

7. [REDACTED]

8. [REDACTED]

9. [REDACTED]

10. [REDACTED]

11. [REDACTED]

12. [REDACTED]

13. [REDACTED]

14. [REDACTED]

15. [REDACTED]

16. [REDACTED]

17. [REDACTED]

18. [REDACTED]

19. [REDACTED]

20. [REDACTED]

21. [REDACTED]

22. [REDACTED]

23. [REDACTED]

24. [REDACTED]

25. [REDACTED]

26. [REDACTED]

27. [REDACTED]

28. [REDACTED]

29. [REDACTED]

30. [REDACTED]

31. [REDACTED]

32. [REDACTED]

33. [REDACTED]

34. [REDACTED]

35. [REDACTED]

36. [REDACTED]

37. [REDACTED]

38. [REDACTED]

39. [REDACTED]

40. [REDACTED]

41. [REDACTED]

42. [REDACTED]

43. [REDACTED]

44. [REDACTED]

45. [REDACTED]

46. [REDACTED]

47. [REDACTED]

48. [REDACTED]

49. [REDACTED]

50. [REDACTED]

51. [REDACTED]

52. [REDACTED]

53. [REDACTED]

54. [REDACTED]

55. [REDACTED]

56. [REDACTED]

57. [REDACTED]

58. [REDACTED]

59. [REDACTED]

60. [REDACTED]

61. [REDACTED]

62. [REDACTED]

63. [REDACTED]

64. [REDACTED]

65. [REDACTED]

66. [REDACTED]

67. [REDACTED]

68. [REDACTED]

69. [REDACTED]

70. [REDACTED]

71. [REDACTED]

72. [REDACTED]

73. [REDACTED]

74. [REDACTED]

75. [REDACTED]

76. [REDACTED]

77. [REDACTED]

78. [REDACTED]

79. [REDACTED]

80. [REDACTED]

81. [REDACTED]

82. [REDACTED]

83. [REDACTED]

84. [REDACTED]

85. [REDACTED]

86. [REDACTED]

87. [REDACTED]

88. [REDACTED]

89. [REDACTED]

90. [REDACTED]

91. [REDACTED]

92. [REDACTED]

93. [REDACTED]

94. [REDACTED]

95. [REDACTED]

96. [REDACTED]

97. [REDACTED]

98. [REDACTED]

99. [REDACTED]

100. [REDACTED]

[illegible]

## SOIL SURVEY

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches  Pct	Percentage passing sieve number--				Liquid limit  Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
Caneyville: 1CbD:	<u>In</u>										
Caneyville part-	0-5	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	75-100	60-95	20-35	2-12
	5-31	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-3	90-100	85-100	75-100	65-100	42-70	20-45
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Beasley part----	0-5	Silt loam-----	ML, CL, CL-ML	A-4	0-5	95-100	90-100	80-100	75-100	25-35	4-10
	5-34	Silty clay, clay	CH, CL	A-7	0-5	95-100	90-100	85-100	75-100	45-70	20-40
	34-50	Silty clay, clay loam, gravelly loam.	CL, CH, CL-ML, ML	A-7, A- 6, A-4	0-10	90-100	85-100	75-100	60-95	20-55	4-35
Crider: CrA, CrB, CrC----	0-13	Silt loam-----	ML, CL,	A-4, A-6	0	100	95-100	90-100	85-100	25-35	4-12

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
Faywood: FsD3-----	In										
	0-4	Silty clay-----	CL, CH, MH	A-7	0-15	90-100	90-100	85-100	80-100	45-60	20-30
	4-27	Silty clay, clay, silty clay loam.	CH, CL	A-7	0-15	90-100	90-100	85-100	75-100	40-70	20-45
	27	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Hagerstown: HaB, HaC-----	0-5	Silt loam-----	CL-ML, CL	A-4, A- 6	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	5-76	Clay, silty clay, silty clay loam.	CH, MH, CL	A-7, A-6	0-5	85-100	80-100	75-100	75-95	33-71	13-37
HsC3-----	0-5	Silty clay loam	CL	A-7, A-6	0-5	85-100	80-100	80-100	70-95	25-50	15-25
	5-71	Clay, silty clay, silty clay loam.	CH, MH, CL	A-7, A-6	0-5	85-100	80-100	75-100	75-95	33-71	13-37
Huntington: Hu-----	0-10	Silt loam-----	ML, CL	A-4, A-6	0	95-100	95-100	85-100	60-95	25-35	5-15
	10-72	Silt loam, loam, silty clay loam.	ML, CL	A-4, A-6	0	95-100	95-100	85-100	60-95	25-35	5-15
Lawrence: La-----	0-8	Silt loam-----	ML, CL, CL-ML	A-4	0	100	95-100	90-100	80-100	25-35	2-10
	8-22	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A- 6, A-7	0	100	95-100	90-100	80-100	25-42	5-20
	22-38	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A- 6, A-7	0	100	95-100	90-100	80-100	25-42	5-20
	38-63	Silty clay, silty clay loam, silt loam.	ML, CL, MH, CL- ML	A-4, A- 6, A-7	0	95-100	90-100	85-100	75-100	25-60	5-25
Lindside: Ln-----	0-48	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	100	95-100	85-100	60-95	25-50	2-25
	48-60	Stratified silty clay loam to fine sandy loam.	ML, CL, SM, SC	A-2, A- 4, A-6	0	100	95-100	60-100	30-95	20-50	1-25
Lowell: LoB, LoC-----	0-6	Silt loam-----	ML, CL, CL-ML	A-4	0-2	100	95-100	90-100	85-100	25-35	4-10
	6-27	Silty clay, clay, silty clay loam.	CL, CH, MH	A-7, A-6	0-2	100	95-100	90-100	85-100	35-65	15-45
	27-59	Clay, silty clay	CH, MH, CL	A-7	0-10	95-100	90-100	85-100	75-100	45-75	20-45
	59	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LsC3-----	0-6	Silty clay loam	CL	A-6, A-7	0-2	100	95-100	90-100	85-100	34-42	15-22
	6-21	Silty clay, clay, silty clay loam.	CL, CH, MH	A-7	0-2	100	95-100	90-100	85-100	35-65	15-45
	21-53	Clay, silty clay	CH, MH, CL	A-7	0-10	95-100	90-100	85-100	75-100	45-75	20-45
	53	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

## SOIL SURVEY

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
Newark: Ne-----	<u>In</u>				<u>Pct</u>						
	0-9	Silt loam-----	ML, CL, CL-ML	A-4	0	95-100	90-100	80-100	55-95	<35	NP-10
	9-38	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A- 6, A-7	0	95-100	90-100	85-100	70-95	25-42	5-20
	38-68	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A- 6, A-7	0-3	75-100	70-100	65-100	55-95	25-42	5-20
Nicholson: NhB, NhC-----	0-7	Silt loam-----	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	80-95	25-35	5-10
	7-27	Silty clay loam, silt loam.	CL, ML, CL-ML	A-6, A- 4, A-7	0	95-100	95-100	85-100	80-100	25-45	5-20
	27-36	Silty clay loam, silt loam.	CL, ML, CL-ML	A-6, A- 4, A-7	0	95-100	90-100	80-100	75-95	25-45	5-20
	36-58	Silty clay, clay, channery clay.	CH, MH, CL	A-7	0-10	80-100	70-100	60-100	55-95	45-70	20-40
Nolin: No-----	0-8	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	80-100	25-40	5-18
	8-85	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	100	80-100	70-100	55-90	25-40	5-18
Otwell: OtB-----	0-7	Silt loam-----	CL, CL- ML, ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	7-24	Silty clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	25-40	5-20
	24-33	Silty clay loam, loam, silt loam.	CL, CL-ML	A-6, A-4	0	95-100	95-100	85-100	65-90	35-50	5-20
	33-62	Silty clay, silty clay loam, silty clay, loam.	CL, ML, MH	A-6, A- 7, A-4	0	95-100	80-100	72-100	60-95	30-55	5-25
Pits: Pt.											
Weinbach: We-----	0-8	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	100	100	85-100	60-90	20-35	5-15
	8-23	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	100	90-100	70-90	25-35	8-15
	23-39	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	100	90-100	70-90	25-35	8-15
	39-54	Silty clay loam, silt loam.	CL, ML, CL-ML	A-6, A- 7, A-4	0	90-100	85-100	75-100	65-95	30-45	5-20
Wheeling: WhA, WhB, WhC, W1D	0-10	Silt loam-----	ML, CL, CL-ML	A-4, A- 6, A-7	0	90-100	90-100	85-100	65-90	<35	NP-10
	10-46	Silty clay loam, loam, gravelly sandy loam.	ML, CL, SM, CL- ML	A-4, A- 6, A-7	0-5	90-100	75-100	45-95	35-85	<35	NP-20
	46-62	Stratified very fine sand to gravel.	GM, SM, SC-SM, SC	A-2, A-3	0-10	55-90	50-75	45-70	12-25	<15	NP-5
Woolper: WoB, WoC-----	0-7	Silty clay loam	CL, ML	A-6, A- 7, A-4	0-10	95-100	90-100	85-100	75-100	34-42	10-22
	7-43	Silty clay, silty clay loam, clay.	CL, CH	A-7, A-6	0-10	95-100	90-100	85-100	75-100	35-65	15-40
	43-55	Clay, silty clay	CH, CL	A-7	0-10	95-100	90-100	85-100	75-100	45-75	20-45

<sup>1</sup>This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not available or were not estimated.

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
Beasley:									
BeB, BeC, BeD-----	0-5	0.6-2.0	0.18-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	3
	5-34	0.2-0.6	0.12-0.18	4.5-6.0	Moderate	Moderate-----	Moderate-----	0.28	
	34-50	0.2-0.6	0.10-0.16	6.6-8.4	Moderate	Low-----	Low-----	0.28	
BfC3, BfD3-----	0-5	0.6-2.0	0.18-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	3
	5-29	0.2-0.6	0.12-0.18	4.5-6.0	Moderate	Moderate-----	Moderate-----	0.28	
	29-46	0.2-0.6	0.10-0.16	6.6-8.4	Moderate	Low-----	Low-----	0.28	
<sup>1</sup> BnF:									
Beasley part----	0-5	0.6-2.0	0.18-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	3
	5-34	0.2-0.6	0.12-0.18	4.5-6.0	Moderate	Moderate-----	Moderate-----	0.28	
	34-50	0.2-0.6	0.10-0.16	6.6-8.4	Moderate	Low-----	Low-----	0.28	
Caneyville part----	0-5	0.6-2.0	0.15-0.22	5.6-7.3	Low-----	Moderate-----	Moderate-----	0.43	3
	5-31	0.2-0.6	0.12-0.18	5.6-7.3	Moderate	High-----	Moderate-----	0.28	
	31	---	---	---					
Boonesboro:									
Bo-----	0-14	0.6-2.0	0.18-0.23	6.1-7.8	Low-----	Low-----	Low-----	0.37	3
	14-28	6.0-20.0	0.06-0.12	6.1-7.8	Low-----	Low-----	Low-----	0.17	
	28	---	---	---					
Brassfield:									
<sup>1</sup> BsE:									
Brassfield part----	0-5	0.6-2.0	0.14-0.20	7.4-8.4	Low-----	Low-----	Low-----	0.43	2
	5-24	0.6-2.0	0.10-0.18	7.4-8.4	Low-----	Low-----	Low-----	0.17	
	24	---	---	---					
Beasley part----	0-5	0.6-2.0	0.18-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	3
	5-34	0.2-0.6	0.12-0.18	4.5-6.0	Moderate	Moderate-----	Moderate-----	0.28	
	34-50	0.2-0.6	0.10-0.16	6.6-8.4	Moderate	Low-----	Low-----	0.28	
Caneyville:									
CaC-----	0-5	0.6-2.0	0.15-0.22	5.6-7.3	Low-----	Moderate-----	Moderate-----	0.43	3
	5-31	0.2-0.6	0.12-0.18	5.6-7.3	Moderate	High-----	Moderate-----	0.28	
	31	---	---	---					
<sup>1</sup> CbD:									
Caneyville part----	0-5	0.6-2.0	0.15-0.22	5.6-7.3	Low-----	Moderate-----	Moderate-----	0.43	3
	5-31	0.2-0.6	0.12-0.18	5.6-7.3	Moderate	High-----	Moderate-----	0.28	
	31	---	---	---					
Beasley part----	0-5	0.6-2.0	0.18-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	3
	5-34	0.2-0.6	0.12-0.18	4.5-6.0	Moderate	Moderate-----	Moderate-----	0.28	
	34-50	0.2-0.6	0.10-0.16	6.6-8.4	Moderate	Low-----	Low-----	0.28	
Crider:									
CrA, CrB, CrC-----	0-13	0.6-2.0	0.19-0.23	5.1-6.5	Low-----	Moderate-----	Moderate-----	0.32	4
	13-40	0.6-2.0	0.18-0.23	5.1-6.5	Low-----	Moderate-----	Moderate-----	0.28	
	40-98	0.6-2.0	0.12-0.18	5.1-6.0	Moderate	Moderate-----	Moderate-----	0.28	
Cynthiana:									
<sup>1</sup> CyF:									
Cynthiana part----	0-5	0.6-2.0	0.15-0.20	6.1-7.8	Moderate	Moderate-----	Low-----	0.37	2
	5-17	0.2-0.6	0.08-0.15	6.1-7.8	Moderate	Moderate-----	Low-----	0.28	
	17	---	---	---					
Faywood part----	0-4	0.6-2.0	0.18-0.22	5.1-7.3	Low-----	High-----	Moderate-----	0.37	3
	4-31	0.06-0.6	0.12-0.17	5.1-7.3	Moderate	High-----	Moderate-----	0.28	
	31	---	---	---					
Beasley part----	0-5	0.6-2.0	0.18-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	3
	5-34	0.2-0.6	0.12-0.18	4.5-6.0	Moderate	Moderate-----	Moderate-----	0.28	
	34-50	0.2-0.6	0.10-0.16	6.6-8.4	Moderate	Low-----	Low-----	0.28	

See footnote at end of table.

## SOIL SURVEY

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
Elk:									
ElB-----	0-7	0.6-2.0	0.18-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.32	4
	7-36	0.6-2.0	0.18-0.22	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.28	
	36-62	0.6-2.0	0.14-0.20	5.1-6.5	Low-----	Moderate-----	Moderate-----	0.28	
Faywood:									
FaC, FaD-----	0-4	0.6-2.0	0.18-0.22	5.1-7.3	Low-----	High-----	Moderate-----	0.37	3
	4-31	0.06-0.6	0.12-0.17	5.1-7.3	Moderate	High-----	Moderate-----	0.28	
	31	---	---	---	---	---	---	---	
FsD3-----	0-4	0.2-0.6	0.14-0.18	5.1-7.3	Moderate	High-----	Moderate-----	0.37	2
	4-27	0.06-0.6	0.12-0.17	5.1-7.3	Moderate	High-----	Moderate-----	0.28	
	27	---	---	---	---	---	---	---	
Hagerstown:									
HaB, HaC, HsC3----	0-16	0.6-6.0	0.16-0.24	5.1-6.5	Low-----	Moderate-----	Low-----	0.32	4
	16-76	0.6-2.0	0.10-0.24	5.1-7.3	Moderate	Moderate-----	Low-----	0.28	
Huntington:									
Hu-----	0-10	0.6-2.0	0.18-0.24	5.6-7.8	Low-----	Low-----	Moderate-----	0.43	5
	10-72	0.6-2.0	0.10-0.16	5.6-7.8	Low-----	Low-----	Moderate-----	0.43	
Lawrence:									
La-----	0-8	0.6-2.0	0.19-0.23	4.5-5.5	Low-----	High-----	High-----	0.43	3
	8-22	0.6-2.0	0.18-0.22	4.5-5.5	Low-----	High-----	High-----	0.37	
	22-38	0.06-0.2	0.08-0.12	4.5-5.5	Low-----	High-----	High-----	0.43	
	38-63	0.06-0.6	0.08-0.12	4.5-7.3	Low-----	High-----	High-----	0.37	
Lindside:									
Ln-----	0-48	0.6-2.0	0.18-0.26	5.6-7.3	Low-----	Moderate-----	Low-----	0.43	5
	48-60	0.6-2.0	0.12-0.18	5.6-7.8	Low-----	Moderate-----	Moderate-----	0.43	
Lowell:									
LoB, LoC-----	0-6	0.6-2.0	0.18-0.23	4.5-6.5	Low-----	High-----	Moderate-----	0.37	3
	6-27	0.2-2.0	0.13-0.19	4.5-6.5	Moderate	High-----	Moderate-----	0.28	
	27-59	0.2-0.6	0.12-0.17	5.1-7.8	Moderate	High-----	Moderate-----	0.28	
	59	---	---	---	---	---	---	---	
LsC3-----	0-6	0.6-2.0	0.18-0.23	4.5-6.5	Low-----	High-----	Moderate-----	0.37	3
	6-21	0.2-2.0	0.13-0.19	4.5-6.5	Moderate	High-----	Moderate-----	0.28	
	21-53	0.2-0.6	0.12-0.17	5.1-7.8	Moderate	High-----	Moderate-----	0.28	
	53	---	---	---	---	---	---	---	
Newark:									
Ne-----	0-9	0.6-2.0	0.15-0.23	5.6-7.8	Low-----	High-----	Low-----	0.43	5
	9-68	0.6-2.0	0.18-0.23	5.6-7.8	Low-----	High-----	Low-----	0.43	
Nicholson:									
NhB, NhC-----	0-7	0.6-2.0	0.19-0.23	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	3
	7-27	0.6-2.0	0.18-0.22	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	
	27-36	0.06-0.2	0.07-0.12	4.5-6.0	Low-----	Moderate-----	Moderate-----	0.43	
	36-58	0.06-0.6	0.07-0.12	5.1-7.8	Moderate	High-----	Moderate-----	0.37	
Nolin:									
No-----	0-8	0.6-2.0	0.18-0.23	5.6-8.4	Low-----	Low-----	Moderate-----	0.43	5
	8-85	0.6-2.0	0.18-0.23	5.6-7.8	Low-----	Low-----	Moderate-----	0.43	
Otwell:									
OtB-----	0-7	0.6-2.0	0.22-0.24	4.5-7.3	Low-----	Moderate-----	High-----	0.43	3
	7-24	0.06-0.2	0.18-0.22	5.1-5.5	Low-----	Moderate-----	High-----	0.43	
	24-33	<0.06	0.06-0.08	4.5-5.5	Low-----	Moderate-----	High-----	0.43	
	33-62	0.06-0.2	0.06-0.08	4.5-7.3	Low-----	Moderate-----	High-----	0.37	
Pits:									
Pt-----									

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permea- bility	Available water capacity	Soil reaction	Shrink- swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
Weinbach:	<u>In</u>	<u>In/hr</u>	<u>In/in</u>	<u>pH</u>					
We-----	0-8	0.6-2.0	0.20-0.24	4.5-7.3	Low-----	High-----	High-----	0.43	3
	8-23	0.6-2.0	0.20-0.22	4.5-6.0	Low-----	High-----	High-----	0.43	
	23-39	<0.2	0.06-0.08	4.5-5.5	Low-----	High-----	High-----	0.43	
	39-54	<0.2	0.06-0.08	4.5-5.5	Low-----	High-----	High-----	0.43	
Wheeling:									
WhA, WhB, WhC, WLD	0-10	0.6-6.0	0.12-0.18	5.1-6.0	Low-----	Low-----	Moderate-----	0.32	4
	10-46	0.6-2.0	0.08-0.12	5.1-6.0	Low-----	Low-----	Moderate-----	0.28	
	46-62	6.0-20	0.04-0.08	5.1-7.3	Low-----	Low-----	Moderate-----	0.24	
Woolper:									
WoB, WoC-----	0-7	0.6-2.0	0.18-0.22	6.1-7.8	Low-----	Moderate-----	Low-----	0.37	3
	7-43	0.2-2.0	0.13-0.19	6.1-7.8	Moderate	Moderate-----	Low-----	0.28	
	43-55	0.06-0.6	0.12-0.17	6.1-7.8	Moderate	Moderate-----	Low-----	0.28	

<sup>1</sup>This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

## SOIL SURVEY

TABLE 16.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See text for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydro- logic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth <u>Ft</u>	Kind	Months	Depth <u>In</u>	Hardness
Beasley: BeB, BeC, BeD, BfC3, BfD3-----	C	None-----	---	---	>6.0	---	---	>60	---
<sup>1</sup> BnF: Beasley part---	C	None-----	---	---	>6.0	---	---	>60	---
Caneyville part	C	None-----	---	---	---	---	---	20-40	Hard
Boonesboro: Bo-----	B	Frequent----	Brief-----	Jan-Apr	---	---	---	20-40	Hard
Brassfield: <sup>1</sup> BsE: Brassfield part	B	None-----	---	---	>6.0	---	---	20-40	Rippable
Beasley part---	C	None-----	---	---	>6.0	---	---	>60	---
Caneyville: CaC-----	C	None-----	---	---	---	---	---	20-40	Hard
<sup>1</sup> CbD: Caneyville part	C	None-----	---	---	---	---	---	20-40	Hard
Beasley part---	C	None-----	---	---	>6.0	---	---	>60	---
Crider: CrA, CrB, CrC----	B	None-----	---	---	>6.0	---	---	>60	Hard
Cynthiana: <sup>1</sup> CyF: Cynthiana part-	D	None-----	---	---	---	---	---	10-20	Hard
Faywood part---	C	None-----	---	---	---	---	---	20-40	Hard
Beasley part---	C	None-----	---	---	>6.0	---	---	>60	---
Elk: ElB-----	B	None-----	---	---	>6.0	---	---	>60	---
Faywood: FaC, FaD, FsD3----	C	None-----	---	---	---	---	---	20-40	Hard
Hagerstown: HaB, HaC, HsC3----	C	None-----	---	---	>6.0	---	---	>48	Hard
Huntington: Hu-----	B	Frequent----	Brief-----	Jan-May	4.0-6.0	Apparent	Dec-Apr	>60	---
Lawrence: La-----	C	None-----	---	---	1.0-2.0	Perched	Dec-Apr	>60	---
Lindside: Ln-----	C	Frequent----	Brief-----	Jan-May	1.5-3.0	Apparent	Dec-Apr	>60	---

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TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
Nolin: No-----	B	Frequent----	Brief-----	Jan-May	<u>Ft</u> 4.0-6.0	Apparent	Feb-Mar	<u>In</u> >60	---
Otwell: OtB-----	C	None----- common.	---	---	1.5-2.5	Perched	Jan-Apr	>60	---
Pits: Pt.									
Weinbach: We-----	C	None-----	---	---	1.0-2.0	Perched	Jan-Apr	>60	---
Wheeling: WhA, WhB, WhC, WLD-----	B	None-----	---	---	>6.0	---	---	>60	---
Woolper: WoB, WoC-----	C	None-----	---	---	>6.0	---	---	>60	---

<sup>1</sup>This mapping unit is made up of two or more dominant kinds of soil. See mapping unit description for the composition and behavior of the whole mapping unit.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Beasley-----	Fine, mixed, mesic Typic HapludalFs
Boonesboro-----	Fine-loamy, mixed, mesic Fluventic Hapludolls
Brassfield-----	Fine-loamy, carbonatic, mesic Rendollic Eutrochrepts
Caneyville-----	Fine, mixed, mesic Typic HapludalFs
Crider-----	Fine-silty, mixed, mesic Typic PaleudalFs
Cynthiana-----	Clayey, mixed, mesic Lithic HapludalFs
Elk-----	Fine-silty, mixed, mesic Ultic HapludalFs
Faywood-----	Fine, mixed, mesic Typic HapludalFs
Hagerstown-----	Fine, mixed, mesic Typic HapludalFs
Huntington-----	Fine-silty, mixed, mesic Fluventic Hapludolls
Lawrence-----	Fine-silty, mixed, mesic Aquic FragiudalFs
Lindside-----	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Lowell-----	Fine, mixed, mesic Typic HapludalFs
Newark-----	Fine-silty, mixed, nonacid, mesic Aeris Fluvaquents
Nicholson-----	Fine-silty, mixed, mesic Typic FragiudalFs
Nolin-----	Fine-silty, mixed, mesic Dystric Fluventic Eutrochrepts
Otwell-----	Fine-silty, mixed, mesic Typic FragiudalFs
Weinbach-----	Fine-silty, mixed, mesic Aeris FragiaqualFs
Wheeling-----	Fine-loamy, mixed, mesic Ultic HapludalFs
Woolper-----	Fine, mixed, mesic Typic Argiudolls

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